the OIL AND GAS JOURNAL

HUGHES Flash-Weld tool joints last the life of your drill stem...

Proved on more than 22,000,000 feet of drill pipe!

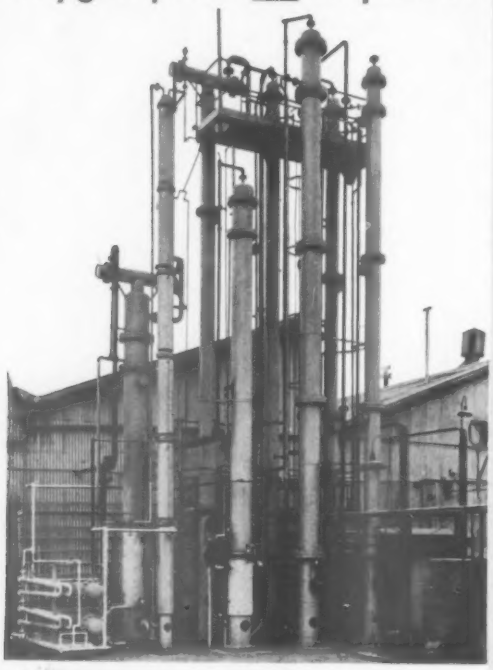
In 15 years, more than 22,000,000 feet of drill pipe have been unitized with HUGHES *Flash-Weld* Tool Joints. Out of this service have come these important facts:

1. HUGHES *Flash-Weld* Joints last the life of your drill stem.
2. HUGHES *Flash-Weld* Joints, when hard-faced, give prolonged service in abrasive formations, and can be *safely* rehard-faced in the field.
3. Under all conditions, HUGHES *Flash-Weld* Joints give you the strongest, most dependable drill stem available.
4. Drill stem costs per foot of hole drilled are lower with HUGHES *Flash-Weld* Tool Joints.

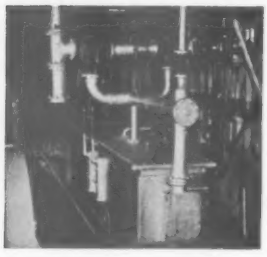
FLASH-WELD
A DEVELOPMENT
OF
HUGHES
TOOL COMPANY
HOUSTON, TEXAS

PRICE 50 CENTS TABLE OF CONTENTS ON PAGE 1 AUGUST 25, 1952

Oxygen plant not required!



Wulff Process Recovery and Purification section. In operation over 19 months, the plant has sold acetylene commercially for the past 10 months.



This fully automatic cracking furnace is the heart of the Wulff Process. In the past 10 months of commercial operation, this unit has required no maintenance—capacities and yields have remained the same.

Available from Fluor

The Wulff Process for the production of acetylene from hydrocarbons is available through The Fluor Corporation. With over 30 years' experience in the design, engineering, and construction of plants and facilities for the petroleum and chemical industries, Fluor possesses the background, the skilled personnel, and the know-how essential for the practical application of the Wulff Process into your particular program.

THE WULFF PROCESS

Acetylene from natural gas, ethane, propane, butane, or any LPG mixture

available through Fluor!

The manufacture of acetylene from hydrocarbons by thermal pyrolysis is now commercially feasible and economically attractive! This has been proved. In January, 1951, the Wulff Process Company placed in experimental operation a commercial-sized acetylene plant. The plant has been operating continuously for the last 19 months. During the last 10 months of this period, acetylene has been sold commercially. This same process may be applied to plants making as little as one ton per day of acetylene to as much as one hundred tons or more per day.

The Wulff Process Company plant has experienced continuous operation on a wide variety of hydrocarbon feed stocks. Methane and propane have been used commercially. Test operations with ethane, butane and various hydrocarbon mixtures have demonstrated that a single plant with modification only in operating conditions can be used for a number of feed stocks. The process can be operated to produce substantial yields of commercial grade ethylene simultaneously.

Regardless of whether your activities lie in the production of petrochemical feed stocks, the manufacture of end petrochemical products, or both, it will pay you to investigate this commercially proven process for the recovery of low-cost acetylene from hydrocarbons. Your nearest Fluor representative will be pleased to provide detailed information on specific requirements. Contact him today!

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THE OIL AND GAS
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- Application of MicroLogging to Determination of Porosity.
- How Dehydration Curtails Corrosion in Pipe Lines.
- Special Directional Drilling Techniques in the Spraberry.
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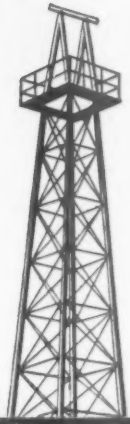
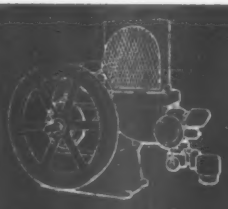
For More in Oil Field Equipment

it's FAIRBANKS-MORSE



Electric Motors



ZC Engines

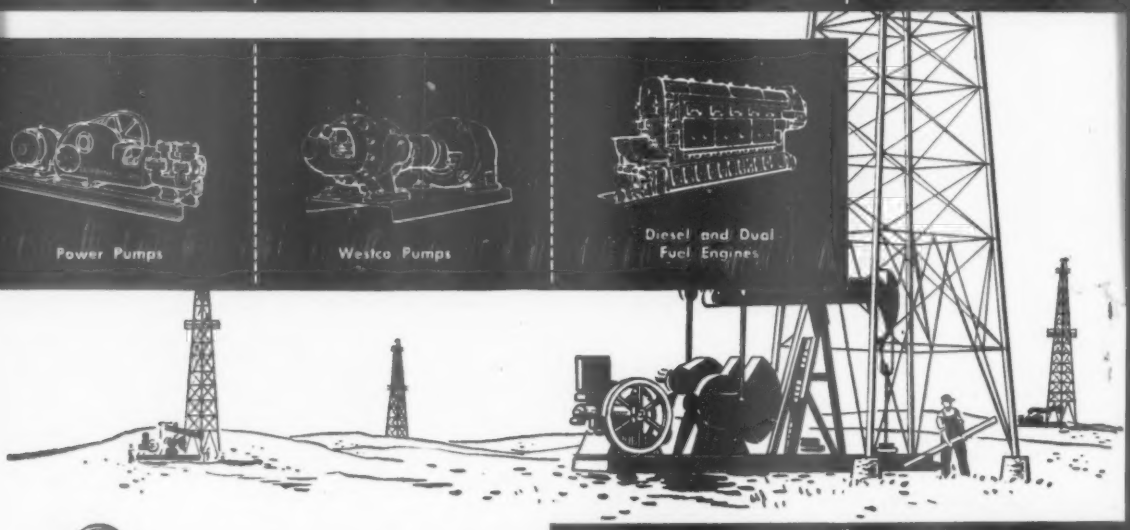
Builtogether Pumps

Rotary Pumps

Power Pumps

Westco Pumps

Diesel and Dual Fuel Engines



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LIGHT PLANTS • DIESEL, DUAL FUEL AND GASOLINE ENGINES
GENERATORS • MAGNETOS

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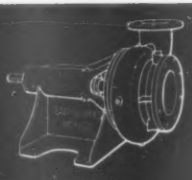

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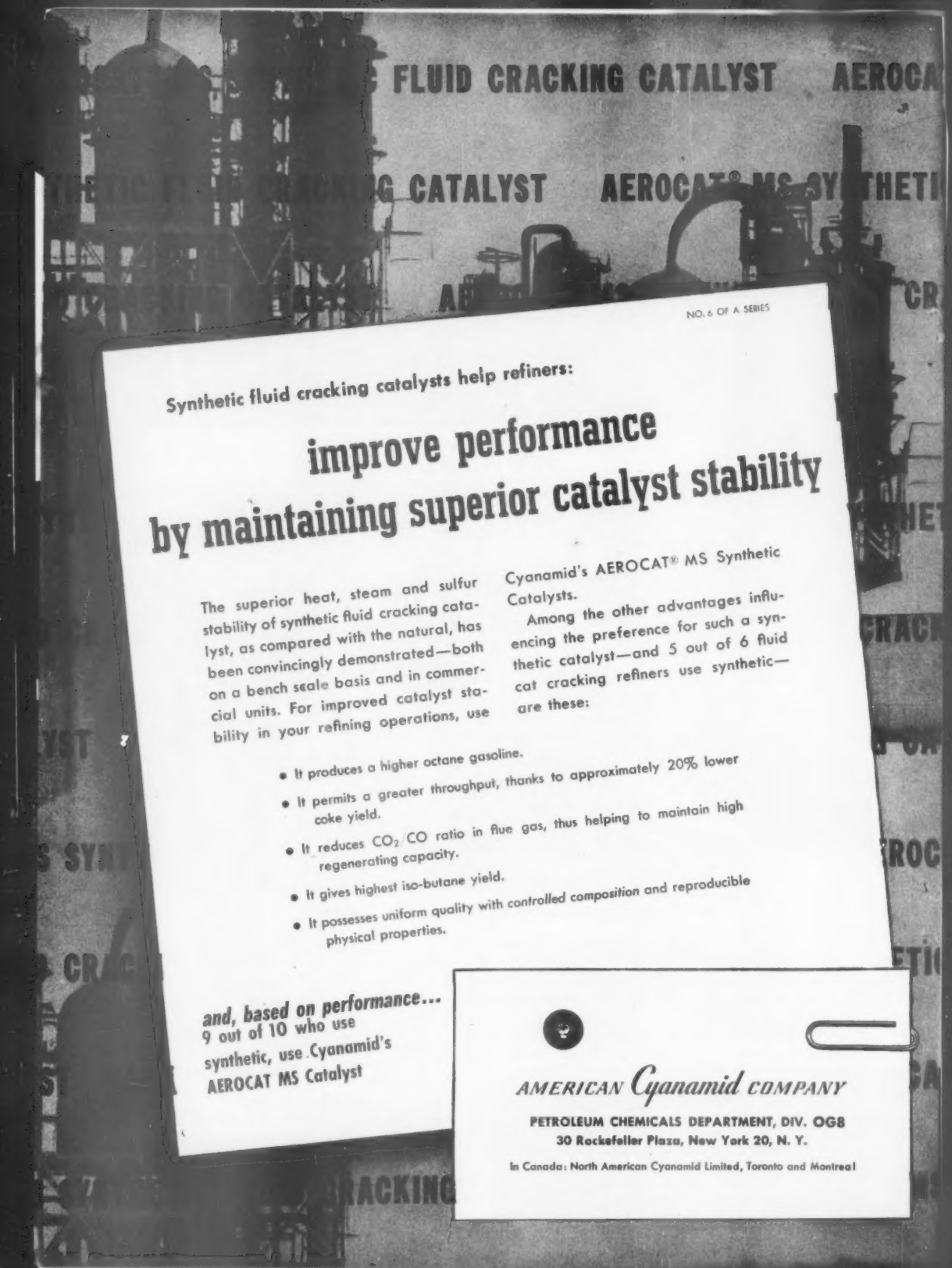

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Synthetic fluid cracking catalysts help refiners:

improve performance by maintaining superior catalyst stability

The superior heat, steam and sulfur stability of synthetic fluid cracking catalyst, as compared with the natural, has been convincingly demonstrated—both on a bench scale basis and in commercial units. For improved catalyst stability in your refining operations, use Cyanamid's AEROCAT® MS Synthetic Catalysts.

Among the other advantages influencing the preference for such a synthetic catalyst—and 5 out of 6 fluid cat cracking refiners use synthetic—are these:

- It produces a higher octane gasoline.
- It permits a greater throughput, thanks to approximately 20% lower coke yield.
- It reduces CO_2/CO ratio in flue gas, thus helping to maintain high regenerating capacity.
- It gives highest iso-butane yield.
- It possesses uniform quality with controlled composition and reproducible physical properties.

and, based on performance...
9 out of 10 who use synthetic, use Cyanamid's AEROCAT MS Catalyst

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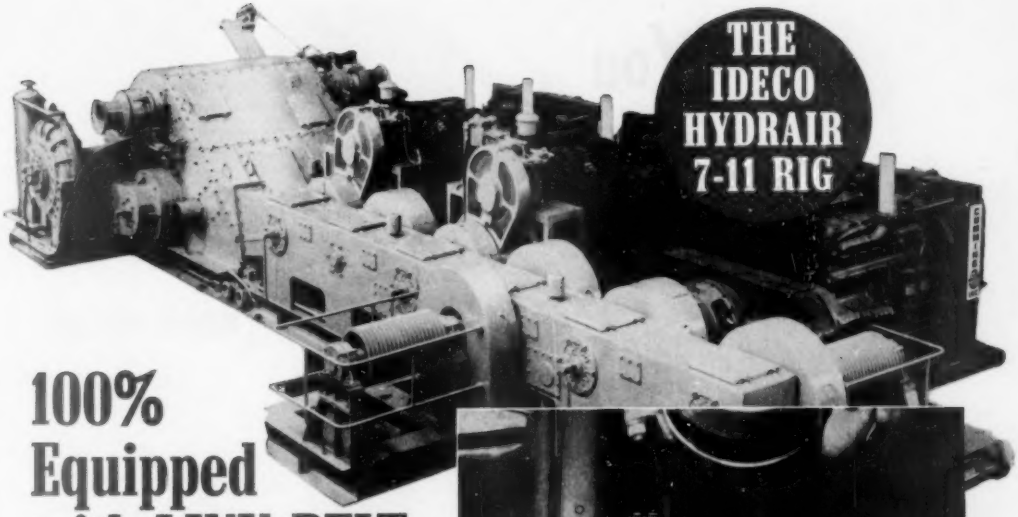
PETROLEUM CHEMICALS DEPARTMENT, DIV. OG8
30 Rockefeller Plaza, New York 20, N. Y.

In Canada: North American Cyanamid Limited, Toronto and Montreal



100% Equipped with LINK-BELT Precision Steel Roller Chain

In this Ideco 7-11 Rig, six diesel engines totalling 1050 h.p. are tied together with Link-Belt Precision Steel Roller Chain. Double, triple, quadruple and sextuple width chains are used for every mechanical drive from input to output—in the twinning drives, compound, transmission and drawworks.

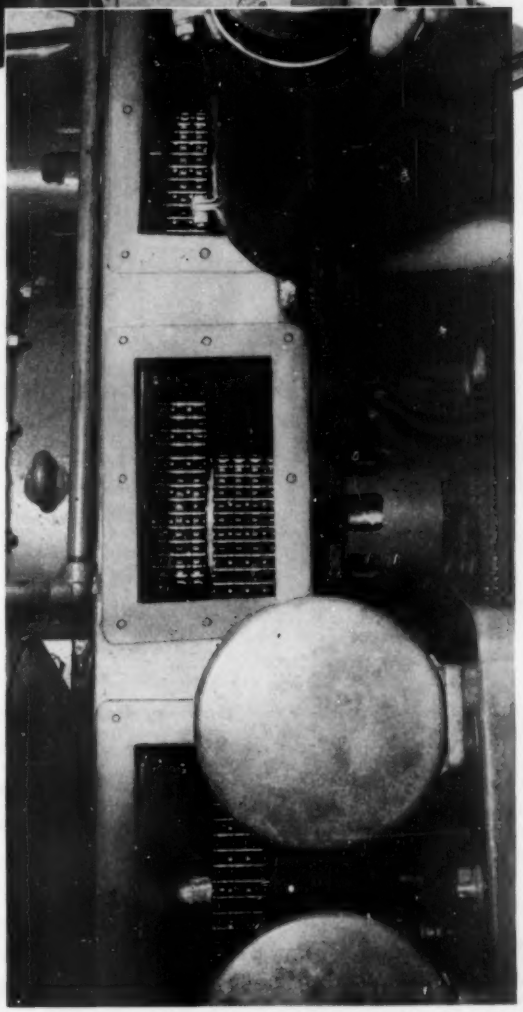
Link-Belt Precision Steel Roller Chain is the oilfield choice for heavy duty service especially where shock loading is a factor. Link-Belt Rollers are shot peened, a process which gives them extra fatigue life, added ability to withstand shock and impact. And Link-Belt precision-controlled heat treating guarantees absolute uniformity of all chain parts.

You'll find Link-Belt Precision Steel Roller Chain on the hardest working oilfield equipment. The Link-Belt Representative in your area will give you the complete story. Why not call him?

LINK-BELT 12,071

PRECISION STEEL ROLLER CHAIN

LINK-BELT COMPANY: Indianapolis 6, Dallas 1, Houston 1, Los Angeles 33, Kansas City 8, Mo., New York 7, Toronto 8.



Close up of the twinning drive in the 7-11.

The Oil and Gas Journal, published Mondays, copyright 1952, by The Petroleum Publishing Company. Entered as second-class matter September 1, 1910, at post office at Tulsa, Okla., under act of March 3, 1879. U. S. and foreign rates to the petroleum industry, $4 yearly.

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air cooled heat exchangers raise many questions

Feasible for this application ?

Induced Draft or Forced Draft ?

Equipment Location ?

Basis of evaluation ?

How to prevent Freezing ?

Can it cool explosive vapors ?

What type material ?

Method of temperature control ?

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"DriCooler" designates an excellent product and an efficient, informative service. Please use this service freely; just address inquiries to Department DC.

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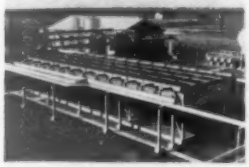
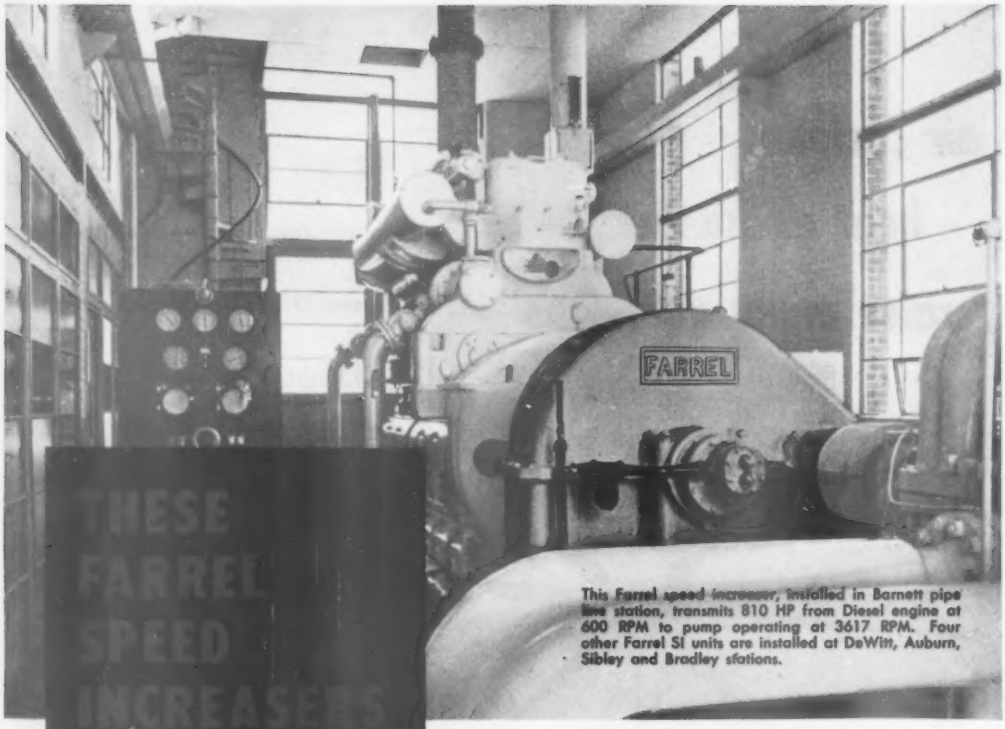


MARLEY

The Marley Company, Inc.

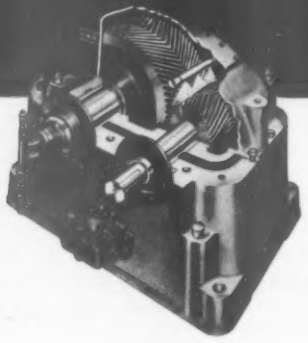
Engineering Sales Offices in 50 Cities

Kansas City 5, Missouri



This Farrel speed increaser, installed in Barnett pipe line station, transmits 810 HP from Diesel engine at 600 RPM to pump operating at 3617 RPM. Four other Farrel SI units are installed at DeWitt, Auburn, Sibley and Bradley stations.

THESE FARREL SPEED INCREASERS WORK DAY AND NIGHT WITH ONLY ONE MAINTENANCE SHUTDOWN A YEAR



Five of these Farrel speed increasing units, installed in five different Illinois stations of Shell Products Pipe Line, have operated continuously, 24 hours a day, for more than five years, shutting down only once each year for routine inspection and maintenance or as required by pumping schedules.

Such outstanding performance is not unusual for Farrel speed increasers. Although hundreds and hundreds of these units have been furnished for pipeline pumping service, not one has ever failed on the job. In fact, every unit installed since 1932, when the line was first developed, is still operating successfully.

For further details of these proved-on-the-job speed increasers, send for a copy of bulletin 448A. No cost or obligation.

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FB-738

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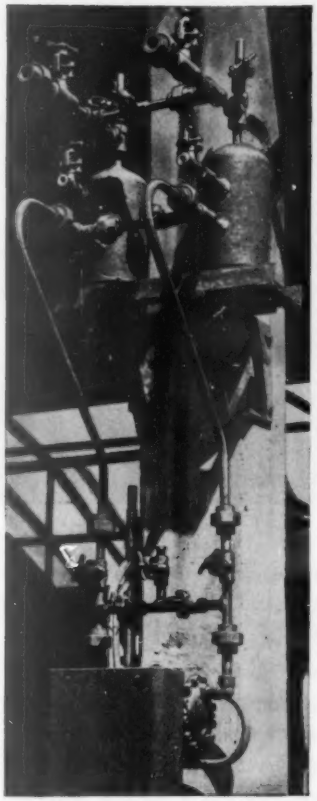
How To Save Money In

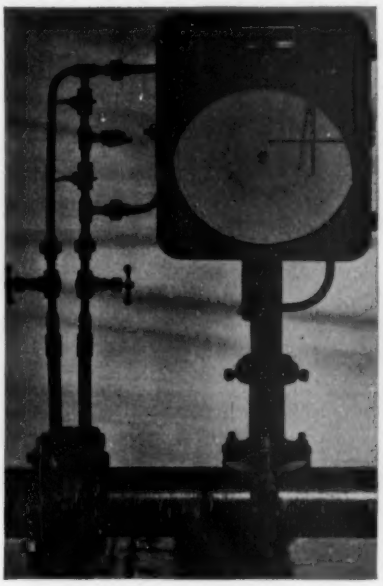
BUYING INSTRUMENT VALVES

A little extra care in choosing the proper valves for a particular instrument application can mean substantial cash savings—sometimes through a much lower initial investment, at other times through the prevention of damage to costly equipment. Here are two case histories where operators received extra value for their valve dollar through careful and informed selection.



CASE 1

—a recording orifice meter on natural gas service. Here the temperature and pressure requirements permit the use of moderately priced Fig. 152 Edward valves. These high strength low cost forged steel globe and angle valves find many applications for gage, meter, and instrument services where no extreme temperatures or pressure exist. Construction features include tight taper-threaded body-bonnet joint, drop forged steel bodies, needle point disks carefully lapped for tight seating joint. Rated for 4000 lb at 150° F or 600 lb at 750° F. Sizes from ⅛" to 1".



CASE 2

—a remote reading flow meter in a major refinery installation where line pressure is over 3000 psi. For the certain protection of costly equipment, tough applications like this demand small valves specifically designed for both high temperature and high pressure service. Ideal are Fig. 952 instrument valves, rated for 6000 psi at 100° F or 1500 psi at 1000° F. Bonnetless, all drop-forged construction for added strength. Special swing gland bolt and packing gland design permits trouble-free repacking. Furnished in globe or angle types, sizes ¼" to 1", in carbon steel or Evalloy 13% chromium stainless steel.

For complete information on the instrument valve for your specific requirements write to Department GV, Edward Valves, Inc.—1492 West 145th Street—East Chicago, Indiana.

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1492 WEST 145th STREET, EAST CHICAGO, INDIANA

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Another Product

DRILLING a new well at Barbers Hill Oil Field in Chambers County, Texas, J. C. Chance Well Service, Inc., relies on "Caterpillar" Diesel power. Two D17000 Oilfield Engines are compounded to turn the rotary table and drive a Cardwell Draw Works on a drill rig that makes as much as 500 ft. in an 8-hr. tour, working a 17¼-in. hole.

During their first 15,000 hours on the job, these two "Caterpillar" Diesel Engines needed *no* major repairs. There's more than one reason behind that kind of performance. Connecting rods in "Cat" Diesels, for example, are made from the finest medium carbon steel, drop-forged, heat-treated and machined to the closest limits. Crankshaft bearing surfaces are "Hi-Electro" hardened and Superfinished for longer life. Crankshaft bearings are long-wearing aluminum alloy. Built-in quality like that means steady, dependable power in the roughest kind of rig service.

Compact "Cat" Oilfield Engines are available in 12 honestly-rated sizes, to 500 HP. Your nearby "Caterpillar" Dealer has complete records on their field performance.

CATERPILLAR TRACTOR CO. • PEORIA, ILLINOIS

CATERPILLAR

REG. U. S. PAT. OFF.

Oilfield Engines

For example . . .

Back in 1925, Ethyl engineers developed a vacuum system that the industry now uses for the mixing of antiknock fluid with gasoline. The heart of the system is an eductor, and the main advantage of the system is that at no time is fluid under pressure. If a leak should develop, air leaks in—not fluid out—an important safety feature.

Over the years, we've improved piping and valve manifolding arrangements, made improvements in mixing techniques, but the basic principle of a completely closed system hasn't been changed. This worried us, because we felt that, with the years and the many technical advances, there

(Continued on next page)

Never leave well enough alone

(Continued from preceding page)

must be a better way to do almost anything. Our research engineers experimented with all sorts of ideas, but couldn't seem to find anything that would do the job any better.

To assure ourselves that we hadn't overlooked anything, we called for an outside opinion. Arthur D. Little, Inc., of Cambridge, Mass., was brought into the picture. They put their best brains on the job. Well—to make a long story short—they could find no way to improve on the eductor system.

The Ethyl mixing system is one of the few things, if not the only one, that we haven't been able to greatly improve over the years. We still hope to find something better. The point is that we are going to keep on trying, because we "never leave well enough alone."

ETHYL CORPORATION

NEW YORK 17, NEW YORK

Ethyl service is backed by 29 years of antiknock experience

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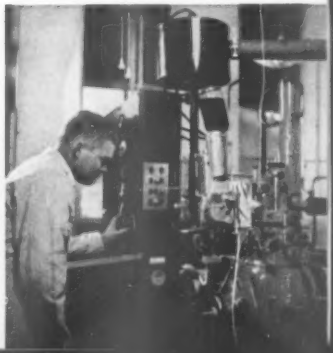
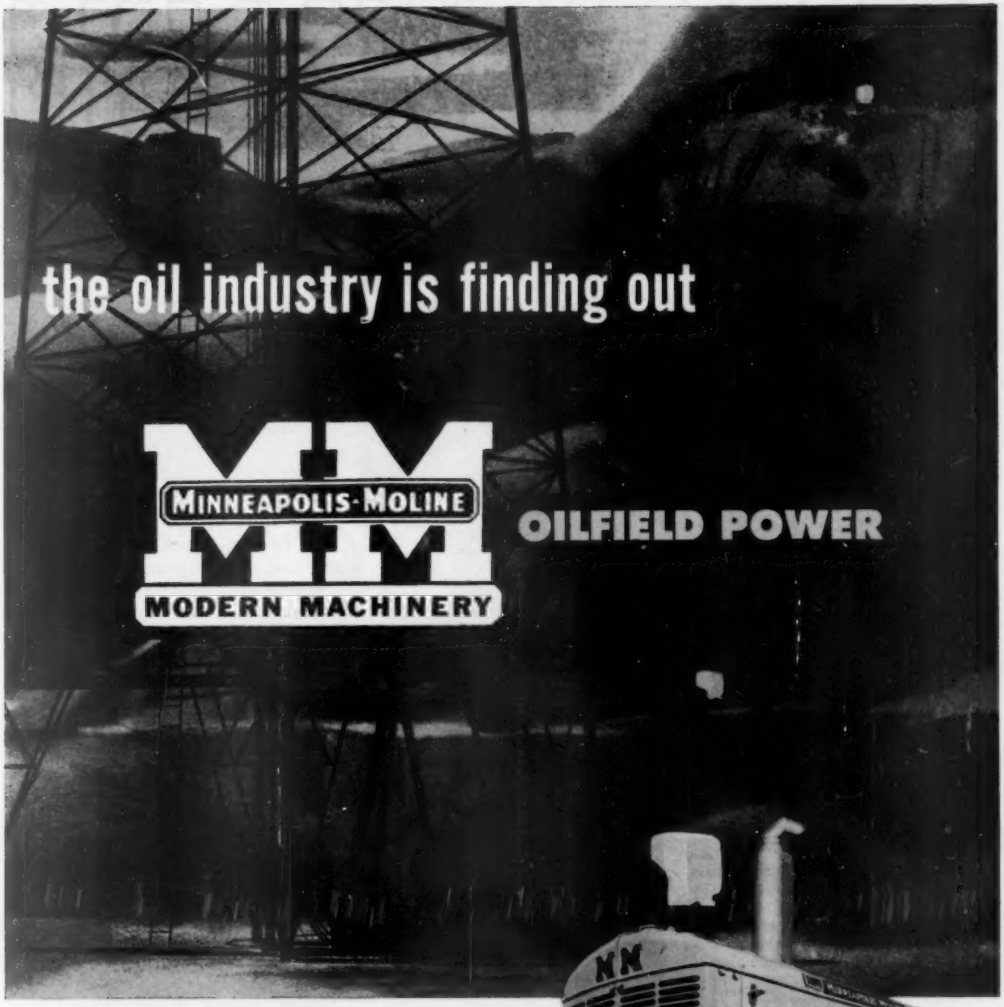
FARM SERVICE

ROAD TESTING

SAFETY SERVICE

GASOLINE TESTING

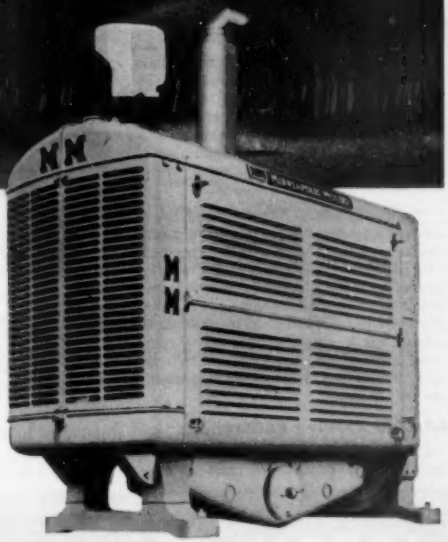




A multicylinder gas engine, properly designed, can operate 24 hours a day, month after month, without stopping—10 years without overhaul. Such is the performance of MM Oil Field Engines.

These engines have been specially designed for this job. Superior methods of filtration cleanse the air, fuel, lube oil and crankcase vapors. Exclusive MM water jacketed base pan with filter cartridge mounted inside, maintaining a 190° constant lube oil temperature, eliminates sludge formation which in ordinary engines combines with dirt and grit to destroy moving parts. Heavy fine grain engine castings easily take severe shocks and strains imposed by oilfield loadings.

Thousands of these engines are operating for satisfied customers in oilfields throughout the world.



MINNEAPOLIS-MOLINE distributed by **SHRIMPTON** MANUFACTURING AND SUPPLY CO.

MINNEAPOLIS 1, MINNESOTA

Canadian Distributor: Disher—Winslow (Alberta) Ltd., Edmonton, Alta.

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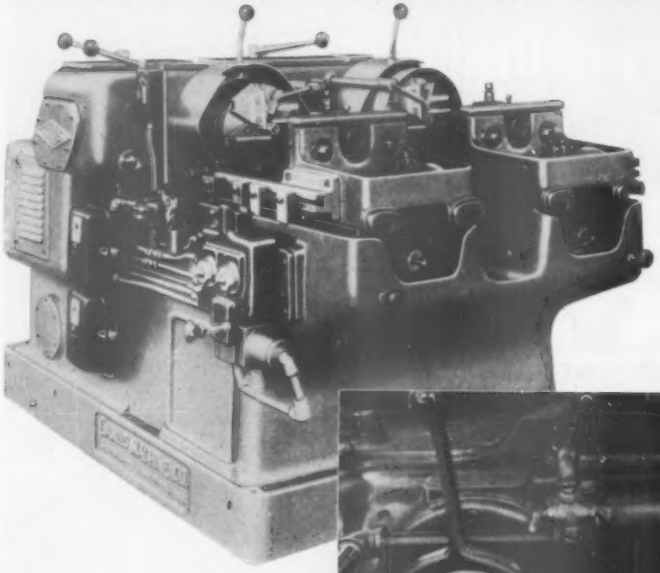
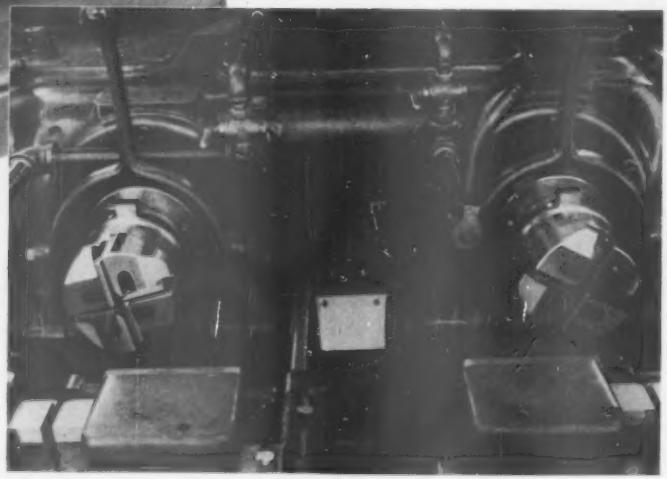
HOLLOW MILLING

Extra LANDIS Feature . . .



LANDIS Die Heads, in addition to conventional threading operations, can be equipped with LANDIS Turning Cutters which will perform turning, grooving, forming, and facing by the hollow milling method. Milling operations may be performed by LANDIS Heads applied to automatic screw machines, turret lathes, or LANDIS leadscrew-type or hydraulic-feed threading machines, and other positive-feed-type machines.



Many Production Advantages

Hollow milling by this method offers an increased efficiency occasioned by the application of a multiple number of cutting tools. The feed rate is thus approximately equal to that of a single tool, multiplied by the number of simultaneously-functioning cutters in the unit—four or six for LANDIS Heads.

The LANDMACO Double Head Leadscrew Threading Machine affords a particularly efficient hollow milling method. One carriage will perform the milling operation while the other carriage is being loaded by the operator, thus allowing consistent continuous production. In addition it is entirely practical to perform milling operations on one spindle and conventional threading operations on the other.

LANDIS Turning Cutters

LANDIS Cutters are economical tools for they are usable for most of their original length. Only the rake angle needs regrinding—a quick and simple procedure. One set of cutters will machine a wide diametrical range of work, and cutting speeds will range from 30 to 70 linear feet per minute.

Wear and breakage of tools and spoiled work is held to a minimum. The cutting edges of the cutters can be precisely and uniformly located with relation to the center line of the work since they are diametrically-opposed in the cutting position. Thus with cutting strains evenly distributed, the workpiece is never forced out of alignment.

Additional information will be supplied on request—please include specifications.

LANDIS *Machine* COMPANY · WAYNESBORO PENNSYLVANIA

Represented in the Domestic Oil Fields by: Colcord-Wright Machinery & Supply Co., St. Louis, Mo.; C. J. Harter Machinery, Houston, Texas; Frederic-Baker Co., New Orleans, La.; Moore Machinery Co., Los Angeles and San Francisco, Calif.; Hendrie & Bolthoff Mfg. & Supply Co., Denver, Colo.

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American Iron & Machine Works Co.
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Our suppliers are a great bunch and we like to tell our customers how much we appreciate the opportunity to handle these manufacturers' products. They help us in every way possible to sell their equipment and stand behind us on any claim of dissatisfaction. We have bought from many of them for almost all of the 27 years we have been in business. We can wholeheartedly endorse the performance of the products whose manufacturers names appear in this advertisement.

IVERSON STORES: Salem, Illinois; Artesia and Farmington, New Mexico; Oklahoma City, Okmulgee and Tulsa, Oklahoma; Kermit, Odessa and Snyder, Texas.

OFFICES:
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IVERSON SUPPLY COMPANY

DRILLING PRODUCTION AND REFINERY EQUIPMENT
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ONE-STOP BUYING

from complete warehouse stocks of all available metals:

Aluminum, Brass, Copper, Inconel*, Monel*, Nickel*, Stainless Steel and Steel. Sheet, Plate, Tube, Pipe, Wire, Rod and Bar, Extrusions, Fastenings and Fittings.

Precision equipment for shearing and slitting

If you operate anywhere in the Midwest or Southwest,

you'll find that the shortest and most direct route to provision of your metal needs is Metal Goods Corporation. Call on us next time. We'll serve you quickly, correctly and completely. That's what we've been doing for years for many users of Aluminum, Brass, Copper, Inconel*, Monel*, Nickel*, Stainless Steel and Steel. Let us demonstrate how Metal Goods Corporation can simplify your company's metal purchasing. We maintain seven well-stocked warehouses and eleven sales service offices to serve you.

*Not stocked in St. Louis or Kansas City territories.

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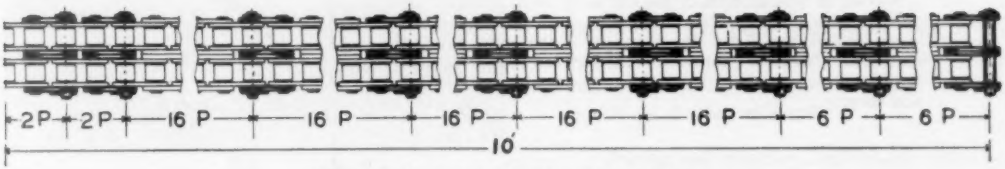
Now it's Even Easier!

TO MAKE UP THE EXACT LENGTH OF CHAIN YOU NEED WITH IMPROVED BALDWIN ASSEMBLY RIVETED ROLLER CHAIN

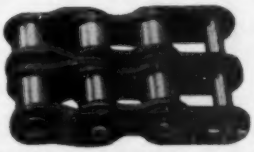
The original Baldwin Assembly ("BA") Riveted Roller Chain completely eliminated old-fashioned, time-consuming, temper-trying, expensive chain cutting, while giving the user all the longer lived advantages of riveted chain. Now, with *Improved* Baldwin Assembly, chain assembly, disassembly and repairs are faster, easier, less expensive than ever before.



No. 100 Baldwin Assembly Riveted Roller Chain

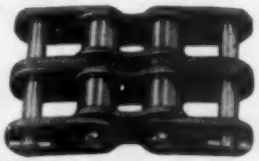
You buy Baldwin Assembly in a packaged unit—a 10-foot strand in every box. Each strand contains a number of conveniently located coupler links at which points the chain can be quickly and easily taken apart. (The location of the coupler links varies slightly for each chain size.) By combining two or more of the sections in the basic 10-foot length, any length of chain required can be made up in the shortest possible time. What's more, there's no danger of damaging chain parts while doing it. If more than 10 feet of chain is needed, just buy an extra box.

SPECIAL PURPOSE SECTIONS



A 3-Pitch Riveted Offset Section

This unit consists of an offset link and a coupler link riveted to a roller link. Use it for any drive requiring an odd number of pitches. We recommend this section instead of a single offset link because the riveted construction increases structural rigidity and durability.



A 3-Pitch Repair Section

This unit consists of two coupler links riveted to a roller link. When one or two links are accidentally damaged, it is often economical to repair the damage with a 3-pitch repair section rather than replace a longer section.

Get all the facts on why the Improved Baldwin Assembly is better than ever. See your local supply store or write for Bulletin 52-3. Chain Belt Company, 4619 W. Greenfield Ave., Milwaukee 1, Wis.

BALDWIN-REX ROLLER CHAINS

A PRODUCT OF

Chain Belt COMPANY OF MILWAUKEE

Baldwin-Rex Oil Field Sales Offices:

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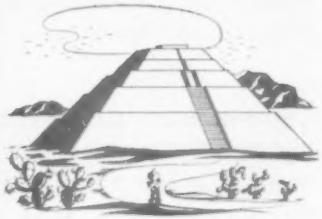
NEW POZMIX

IMPORTANT DEVELOPMENT IMPROVES CEMENTING AT REDUCED COST!

Now, Halliburton's pozzolanic cement is ready to give you many new advantages at big savings per cement job!

Already proved in many wells, and many fields, Pozmix gives you the permanent durability that only pozzolanic cement provides. Roman and Aztec structures prove the ability of these materials to weather centuries... their choice in the engineering of many major dams today is proof of pozzolanic resiliency and density.



★ **POZMIX**

AFFORDS BETTER PROTECTION THAN NEAT SLURRY

Pozmix resists sulphate and acid water. It pumps at lower pressures... sets with lower density. Pozmix has greater resilience than neat cement slurry of the same consistency... lower heat of hydration. Pozmix shows far less shattering when perforated. In short, you get superior protection under the most severe conditions of deep well temperatures, pressures, formation chemical reactions, and drilling fluids... *with longer casing life!*

★ **POZMIX**

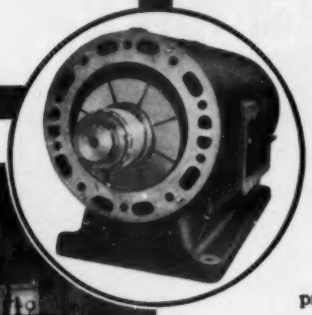
AVAILABLE FROM HALLIBURTON ONLY

Halliburton alone has the plants and bulk cementing equipment to deliver expertly blended pozzolanic materials premixed in unlimited quantity. The amazing *in-the-well economy* of Pozmix is yours now by simply contacting your nearby Halliburton Representative. Or write Halliburton Oil Well Cementing Company, Duncan, Oklahoma.

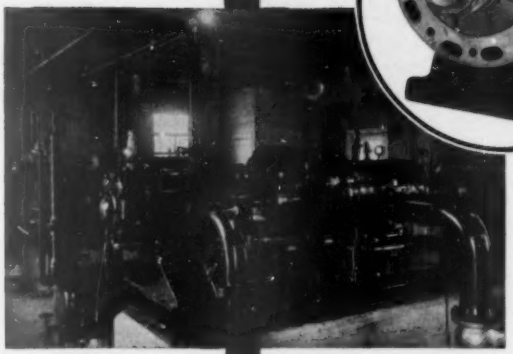
YEARS AHEAD IN OIL WELL CEMENTING

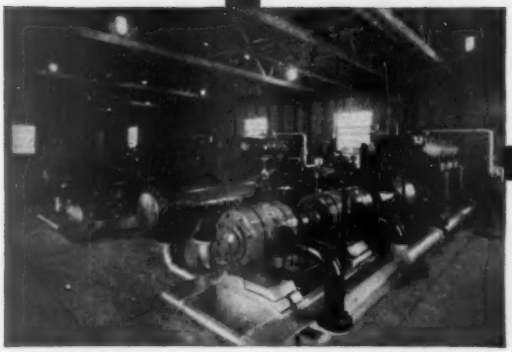
HALLIBURTON

gas gets a better boost



when FULLER gets in the picture





Consider Fuller Rotary Compressors in the over-all picture of your operations. In booster work, whether for field boosting or to trunk line levels, you'll find these compressors doing a better job . . . better because they reduce maintenance cost, cut inspection time, last longer, do the job efficiently.

Pulsing and vibration, valves and complicated parts are eliminated by multi-vane rotary construction. Moving parts are few . . rotor, blades, and bearings. Blades automatically compensate for wear, *maintaining full capacity for the life of the machine.* These features explain why Fuller boosters do an outstanding job wherever gas is handled.

If you're interested in getting maximum efficiency and economy into your operational picture, call on a Fuller Engineer. Bulletin C-5 contains a detailed description of Fuller Rotary Compressors. Write for your copy today.

FULLER COMPANY, Catasauqua, Pa.
120 So. LaSalle St., Chicago 3
420 Chancery Bldg., San Francisco 4

Fuller

DRY MATERIAL CONVEYING SYSTEMS AND COOLERS—
COMPRESSORS AND VACUUM PUMPS—
FEEDERS, AND ASSOCIATED EQUIPMENT

C-218

See for Yourself WHY

Gates Vulco Ropes Wear Longer

Twelve oil wells of the Pace Petroleum Co. near East Comanche, Okla., are pumped from a central power house. When the crankshaft of the engine broke, a high speed engine was chosen to drive the bandwheel. Using the old engine bed and bearings to mount a jackshaft, the owners installed the inexpensive Gates Vulco Rope drive shown and connected the new engine without major changes in the plant arrangement.

Make this Simple Test

Take any V-belt that has *straight* sides. Bend that V-belt while you grip its sides between your fingers and your thumb. You will *feel* the sides of the belt *bulge out*—as shown in figure 1-A, below.

Clearly, that outbulge forces the sides of the belt to press *unevenly* against the V-pulley—and this concentrates the *wear* where the bulge is greatest.

Now, make the same test with the belt that is built with the Concave Sides—the Gates Vulco Rope.

Figures 2 and 2-A show clearly what happens when you bend a Vulco Rope. Instead of *bulging*, the precisely engineered Concave Sides merely *fill out* and become perfectly straight. This belt, when bent, precisely fits its sheave groove.

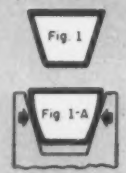
Because there is *no bulging*, the sides of the Gates Vulco Rope always grip the full face of the V-pulley *evenly* and therefore wear *uniformly*—resulting in *longer belt life* and *lower belt costs for you.*

When you buy V-belts, be sure to get the V-belt with the Concave Sides--the Gates Vulco Rope!

Gates Engineering Offices and Jobber Stocks are located in all industrial centers of the United States and in 71 foreign countries.

What Happens When a V-Belt Bends

Straight-Sided V-Belt



How Straight-Sided V-Belt Bulges in Sheave-Groove. Sides Press Unevenly Against V-Pulley Causing Extra Wear At Point Shown by Arrows.

Gates Vulco Rope with Concave Sides

The Concave Sides Fill Out to a Precise Fit in the Sheave-Groove. No Side Bulge! Sides Press Evenly Against the V-Pulley -- Uniform Wear — Longer Life!

CS-528-E

Gates VULCO ROPE DRIVES

THE GATES RUBBER COMPANY • DENVER, U.S.A.

V-Belts — Hose
Molded Rubber Goods
for industry
World's Largest Maker of V-Belts

Something new in side wall coring!

Designed and built for performance in keeping with the high standards set by Schlumberger, this large Side Wall Core Taker has quickly established new records for economy and efficiency. It recovers cores 1 3/16" in diameter, 2½" long, and can be run in holes 7" or larger in diameter. Bullets in the 30 shot gun are fired individually and can be placed at the desired depth by recording a standard Schlumberger SP curve on an electrode close to the gun. Ask your Schlumberger engineer for details. When you call Schlumberger, you can be **sure** of results.

As many as 30 cores large enough for accurate quantitative analysis of physical properties can be obtained on one trip in the hole with the new LARGE Schlumberger Sample Taker.

SCHLUMBERGER

SCHLUMBERGER
WELL SURVEYING CORP.

***FIRST** in the Field **FOREMOST** in Research*

Helping You Cut Fire Losses

As leading manufacturers of fire fighting equipment, Rockwood makes many products that contribute vitally to the quick extinguishment or effective control of all kinds of fires. On this page are representative Rockwood products that daily play a vital role in fire protection programs throughout the nation.

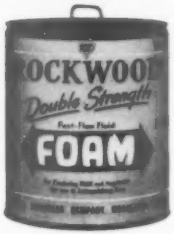
For further details on these products, and many, many others, write for your free copy of the Rockwood Catalog, "Fire Fighting Products." ROCKWOOD SPRINKLER COMPANY, 104 HARLOW STREET, WORCESTER 5, MASS. Distributors in all principal cities.

ROCKWOOD

ROCKWOOD SPRINKLER COMPANY

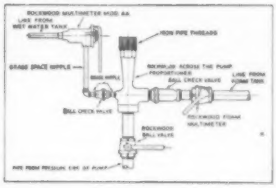
Engineers Water . . . to Cut Fire Losses

Type SG-48 WaterFOG Nozzle. Easy to handle. Discharges high or low velocity WaterFOG or straight water stream.



Double Strength Foam Liquid for fire hose line Nozzles and permanently piped FogFOAM and FOAM installations.

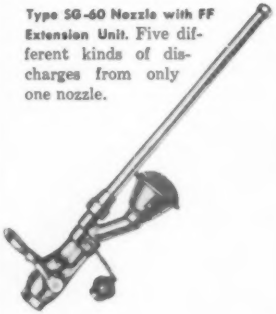
Type FFF FogFOAM Nozzle. Discharges FogFOAM, Solid FOAM stream, and High Velocity WaterFOG.



Proportioning systems. Used when pressure is maintained by pump. Custom-engineered systems also available.

Foam Eductor. Introduces FOAM liquid into hose lines. Used with Type FFF FogFOAM Nozzles.

High Capacity WaterFOG Nozzle. Quickly controls and extinguishes large fires in buildings and flammable liquids.



Type SG-60 Nozzle with FF Extension Unit. Five different kinds of discharges from only one nozzle.

Hydraulically or Manually Controlled Type FFF FogFOAM Turret Nozzle for airport crash fire fighting trucks and others.

Make Oil-Field Hose Assembly Easier, Faster, Safer

ANCHOR

. . . use Anchor Reusable Couplings with exclusive, patented features

Oil-field equipment manufacturers like Anchor two-piece reusable couplings. Oil-field equipment users like them, also, because you get more for your money with Anchor. You get an exclusive, patented design that saves you time and trouble — a grip that's safer, more dependable. Look at these advantages:

- **Assembly is easy and fast.** All you need is an oil can, a wrench, and a vise. It's that simple!
- **No expensive inventory** of prefabricated hose assemblies. Simply carry one coil in the sizes you use. Cut it to the lengths you need.
- **Anchor's exclusive patented grip** keeps hose assemblies on the job day-in and day-out — prevents leaks and dangerous blow-offs. Couplings can be used over and over again.
- **Downtime reduced.** One of your greatest expenses is cut — costly downtime in the field. Servicing can be performed immediately *without special tools.*
- **Streamlined coupling design** makes possible neat, efficient installations, even in confined spaces.

Anchor makes the most complete line of hydraulic hose assemblies and fittings available. That's why you can select the hose assembly that fits your needs — a hose assembly that lasts longer, performs better, handles easier. For best results, let Anchor go to work for *you*. Send coupon for additional information.

Attach coupon to your letterhead and mail today!

ANCHOR COUPLING CO. Inc.
FACTORY: Libertyville, Ill. • BRANCHES: Detroit, Mich.; Dallas, Tex.

ANCHOR COUPLING CO. INC.
Dept. OG-62, Libertyville, Illinois

Yes, I'm interested in Anchor 2-piece reusable couplings. Send me more information.

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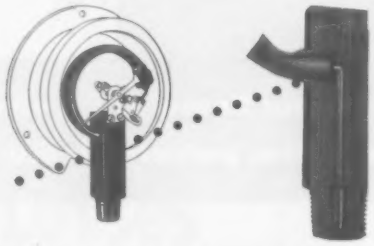
COMPANY NAME .....

COMPANY ADDRESS .....

CITY ..... (. . .) STATE.....

MARSH *Introduces*—

the most significant pressure gauge development since the "Recalibrator"



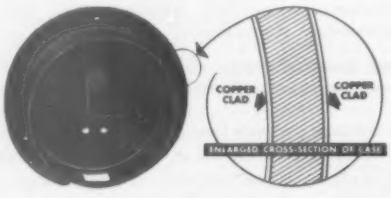
Socket, tube, and end-piece fused into one-piece unit —The problem in every pressure gauge has always been to make permanently leak-tight joints from the inlet to the tip of the bourdon tube.

Marsh construction has always provided the utmost in leak-tight assemblies. But just as welded piping is always more sound than the best joined piping, the fusing of the assembly into an integral unit reduces the possibility of leakage to the vanishing point.

It required extensive research to develop a method of welding the parts into a one-piece unit, but a special process has now been perfected. The result is known as

the "Canoweld" Tube

After fusing, the tube is accurately tempered to required resiliency. The unretouched photo of a socket sawed in half shows the perfect fusion of the joint most difficult to make — the joint where the tube enters the socket. Photomicrographs are available to prove the perfection of the process.



Four times as strong and one-third lighter than a cast iron case — This copper-clad, wrought steel case of boiler plate thickness has the advantages of any type of case — without the faults. It is known as

the "Marshalloy" Case

This case is four times as strong and one-third lighter than conventional cast iron cases. The copper surface makes it as non-corrosive as a plastic or die-cast case. It is finished in a newly developed corrosion-resistant satin black enamel that makes it as attractive as it is durable. Fitted with Marsh safety blow-out plug, it sets a new standard in gauge housing.

THE Marsh developments presented here unquestionably represent the two greatest contributions to pressure gauge accuracy and stamina in recent years . . . the most important advancements since the introduction of the Marsh "Recalibrator."

These improvements take on all the more significance from the fact that they are contributed to the line of gauges that has become the symbol of gauge accuracy and permanence . . . the Marsh "Mastergauge" line.

Foremost and most basic of these improvements is the fusing of the socket, tube, and end-piece into the equivalent of *one-piece* construction. Marsh Methods have always achieved the utmost in leak-tight construction, but here is something still better: the joints are *eliminated!*

Second only to the one-piece socket, tube, and end-piece is that new "Marshalloy" copper-clad case. It is a case that retains all advantages of all kinds of cases; eliminates all the faults.

Read the facts opposite and you will see how the finest line of pressure gauges has been made still better.

MARSH INSTRUMENT CO.
Sales Affiliate of Jas. P. Marsh Corp.
Dept. L, Skokie, Ill.

Houston Branch Plant
1121 Rothwell St.
Houston, Texas

MARSH GAUGES

"THE STANDARD OF ACCURACY"

THERMOMETERS • WATER REGULATING VALVES
SOLENOID VALVES • HEATING SPECIALTIES

IMPROVE DESIGN AND *Cut Costs*

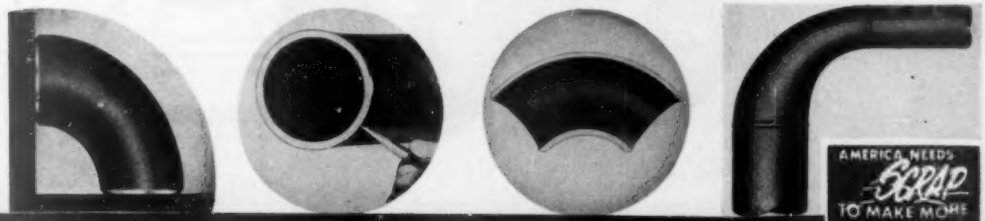
WITH MIDWEST WELDING FITTINGS

Exact included angle; true center-to-end dimension.

True circular cross-section; accurate "land" and bevel.

Uniform wall thickness; smooth interior.

Midwest Reducing elbow; only two welds required. Substantial saving over standard elbow and reducer; better appearance; less turbulence and pressure drop.



AMERICA NEEDS SCRAP TO MAKE MORE STEEL

Jones & Laughlin Supply Company

EXPORT: 405 Lexington Ave., New York, N. Y., U. S. A.

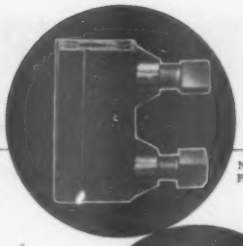
88 STORES • 19 OFFICES • 9 RESIDENT SALESMEN

General Offices: TULSA, OKLAHOMA

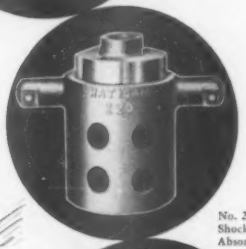
J&L STEEL

Subsidiary of Jones & Laughlin Steel Corporation

MORE profitably producing wells are RATIGAN equipped...

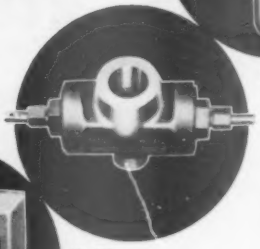


No. 204
Polished Rod Grip

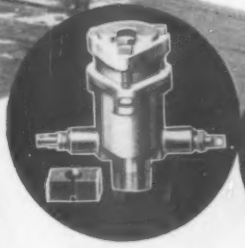


No. 220
Shock
Absorber

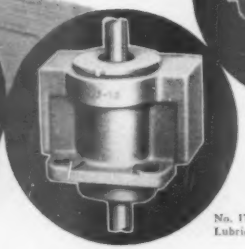
No. 219
Wire Line Clamp



No. 212
Blowout Preventer



No. 176
Stuffing Box



No. 176-1P
Lubricating Cap

Regardless of well depth, Ratigan "Sure-Grip" Oil Well Pumping Equipment gives maximum efficiency at far less operating and maintenance cost...assures greatest return per dollar investment. Ratigan products have been proved by many years of top performance under all operating conditions, and in all major producing areas more and more operators are insisting on Ratigan Equipment. Why not specify Ratigan Pumping Equipment on your well?...sold by leading supply stores everywhere.

SUCKER ROD ELEVATORS • TUBING ELEVATORS
SPRING SUCKER ROD HOOKS
OIL-LESS BEAM HANGERS AND ROD HANGERS
OIL-LESS BEAM ROCKERS AND STIRRUP BEARINGS
SPRING SWIVEL LINKS AND "C" LINKS
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BLOWOUT PREVENTERS • LUBRICATING CAP

Write for Descriptive Catalog

J. P. RATIGAN, Inc.
1213 Santa Fe Avenue, Los Angeles 21, California

Export: National Supply Company, Inc., Export Division, 600 5th Avenue, New York 20, N. Y.

Ratigan Pumping Equipment Is RIGHT for Your Producing Well

All SHELL AND TUBE ...HEAT EXCHANGERS by Vogt

ABOVE: View of new construction at Louisville Refining Company.

BELOW: Some of the many Shell and Tube Exchangers.

Engineered and Licensed by UNIVERSAL OIL PRODUCTS CO.

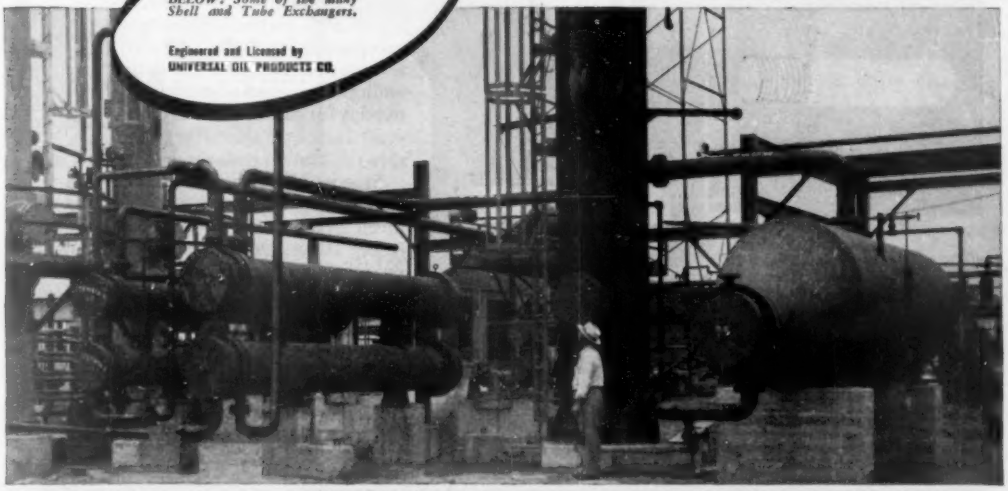
At LOUISVILLE REFINING CO.'S New CATALYTIC CRACKING PLANT

Premium gasoline production has been boosted 20% from the same amount of oil charged since the Louisville Refining Company's new Catalytic Cracking Plant went on stream.

The new plant uses Vogt Shell and Tube Heat Exchangers exclusively and they make a significant contribution to the efficient and economic operations of this progressively modern refinery.

Vogt Shell and Tube Heat Exchangers are available in many different types, with fixed or removable tube bundles, to meet the special problem and specific operating conditions of each installation. They are constructed from carbon and special steels to meet every temperature, pressure, or vacuum service requirement.

WRITE FOR BULLETIN HE-6



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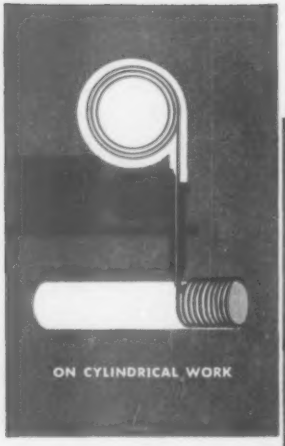
STOODY 104



A New Tubular Fabricated Build-up Wire

Stoody 104 was specifically developed to supply properties lacking in high carbon weldments—exceptional strength, ductility, resistance to abrasion and deformation. Designed also as a final overlay for certain types of equipment such as tractor track rails, sheaves, mine car wheels, etc.

Stoody 104 bonds readily to all weldable SAE and AISI steels, forms an ideal underlay for hard-facing alloys. Deposits are readily machinable and respond to heat treatment.

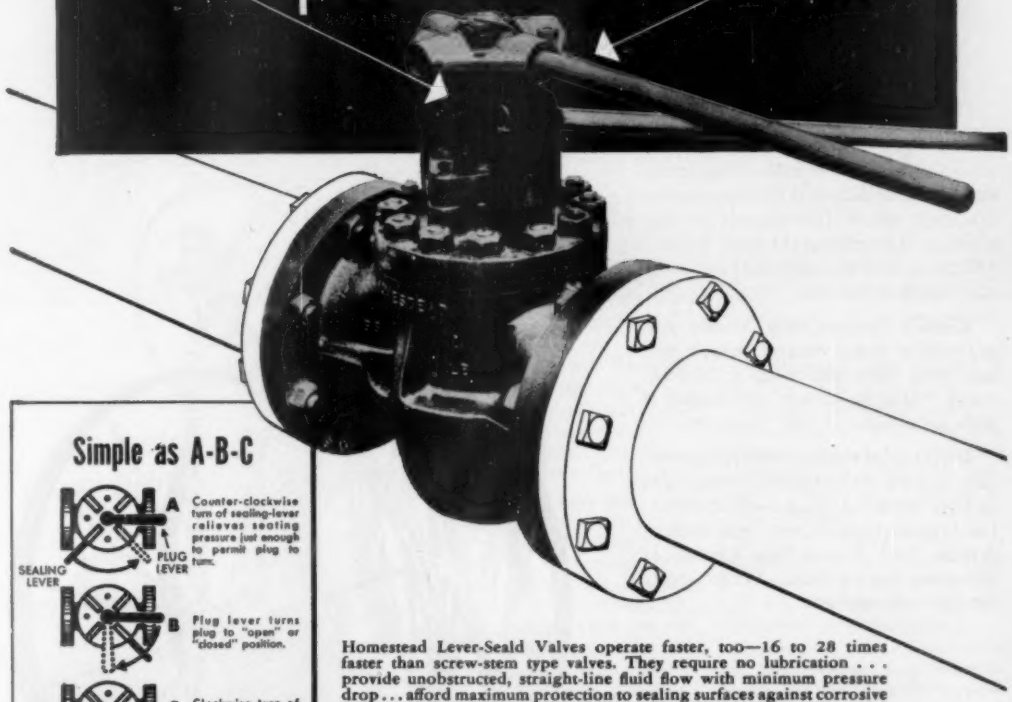
Ask for fully descriptive folder from your Stoody dealer . . . listed in the telephone directory "yellow pages" . . . or write to

STOODY COMPANY
11938 E. SLAUSON AVENUE,
WHITTIER, CALIFORNIA

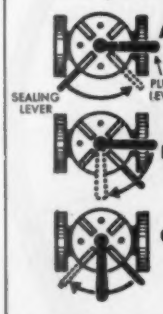
- **at all times**
- **under all conditions**
- **throughout its long lifetime of service**

This Homestead Valve will always work

it's **stickproof** because it's **lever-seald**



Simple as A-B-C



A Counter-clockwise turn of sealing-lever relieves seating pressure just enough to permit plug to turn.

B Plug lever turns plug to "open" or "closed" position.

C Clockwise turn of sealing-lever restores full seating pressure.

Homestead Lever-Seald Valves operate faster, too—16 to 28 times faster than screw-stem type valves. They require no lubrication . . . provide unobstructed, straight-line fluid flow with minimum pressure drop . . . afford maximum protection to sealing surfaces against corrosive and erosive line fluids. And because only a quarter-turn is needed for full opening or closing, they are ideal for installation in restricted areas where operation of other types of valves might be difficult.

Next time you have damaged or sticking valves, replace them with Homestead Lever-Seald Plug Valves. Once you use them you'll never be satisfied with ordinary valves.

For complete information write for Valve Reference Book No. 39-3.

HOMESTEAD LEVER-SEALD PLUG VALVES

HOMESTEAD VALVE MANUFACTURING COMPANY

Serving since 1892

P.O. BOX 403 CORAOPOLIS, PA.

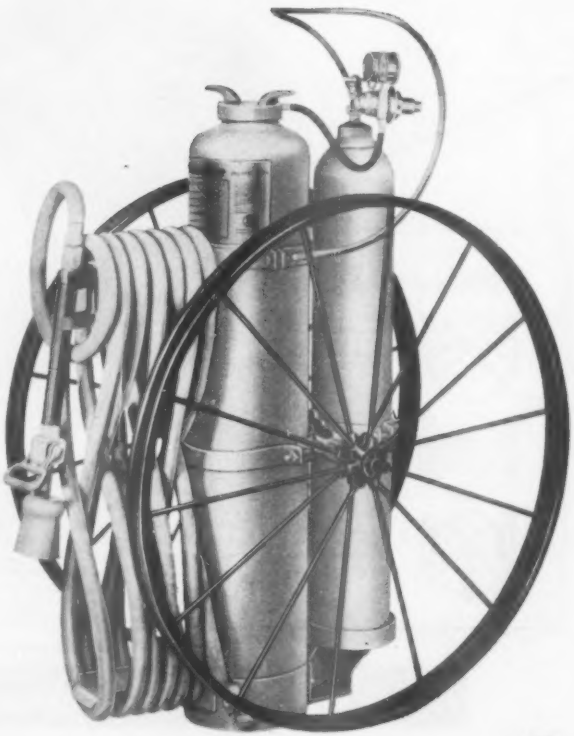
1 man....
1 minute....
1 mobile unit....

.... and the fire's out!

That's right. It takes one man just one minute at the nozzle of this latest model *Kidde* Wheeled Extinguisher to discharge all of 150 pounds of fire-choking dry chemical. And, Mister, 150 pounds of dry chemical can snuff out a mighty big fire.

Kidde's "instant flow" nozzle and adjustable hand control means you can beat back fire with a 30-foot-range "straight stream" or blanket it with an improved "fan" pattern.

If you want really powerful protection against exceptionally large fires in live electrical equipment, flammable liquids, textiles, etc., you want a *Kidde* 150 pound Dry Chemical Wheeled Extinguisher. Write today for full information.



Kidde

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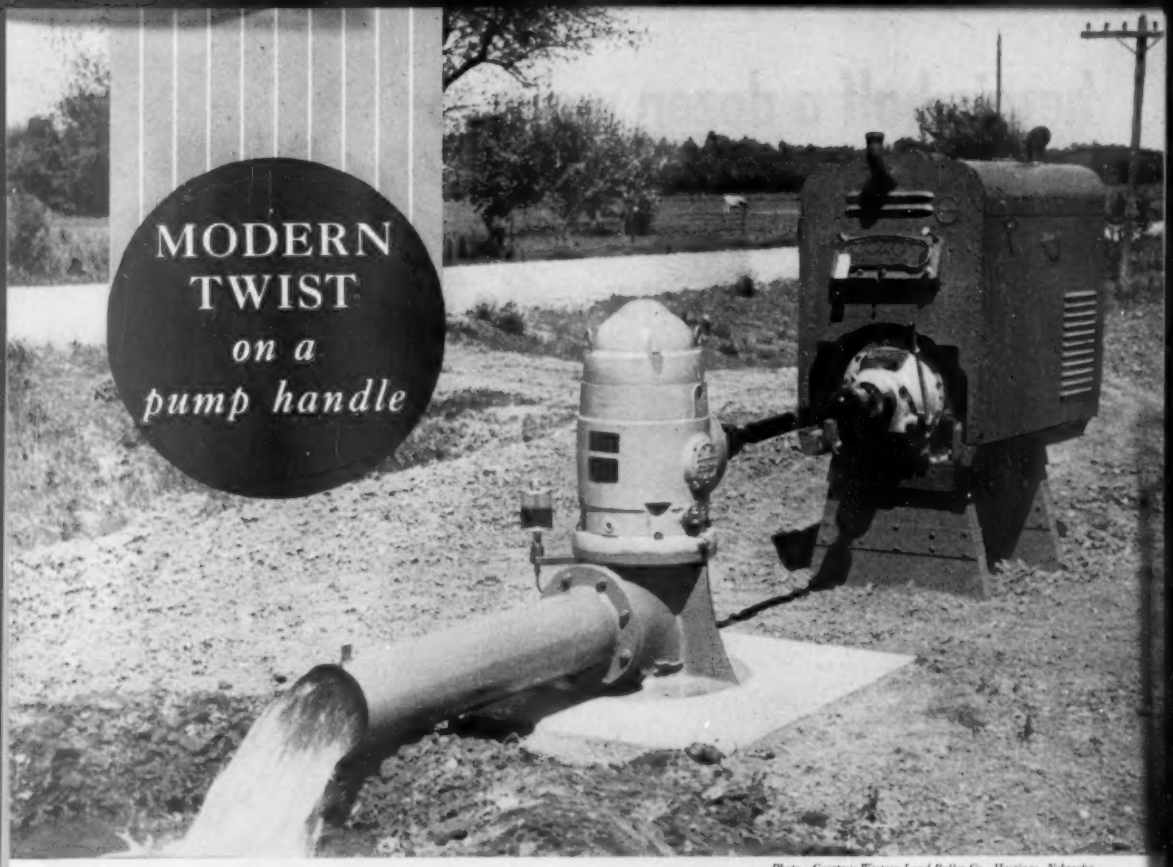
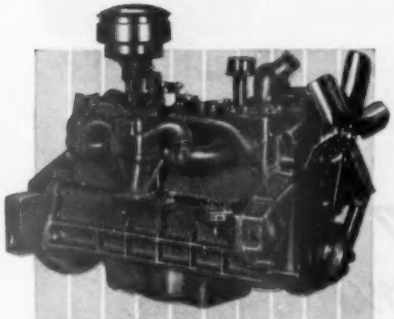


Photo—Courtesy Western Land Roller Co., Hastings, Nebraska

discharges 1050 gallons of water a minute from 100 feet down!



This 8-inch Deep Well Turbine Pump is furnishing water for irrigation purposes near Hastings, Nebraska. It is powered by a Model 8-A Chrysler Industrial Engine with right angle gear drive.

This is Chrysler high speed and Chrysler high compression doing a specialized job. Other farming, construction, industrial and specialized applications are no exception to this kind of regular performance. Here are a few of the advantages you get in Chrysler Industrial Engines: superfinished wear surfaces, sodium cooled exhaust valves, updraft or downdraft carburetion—and there are many more tailored to the exact needs of your job.

Chrysler Industrial power is not expensive. Production-line methods adapted to specialized industrial engine building, provide a custom-built engine at mass production prices.

See a Chrysler Industrial Engine Dealer. Tell him your power needs. He can supply you with one of 9 Chrysler Industrial Engines for your purposes.

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Industrial Engines

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here's half a dozen ways to

Save Time, Labor, and Money

on your drilling rigs

FORGED STEEL AND MALLEABLE COUPLINGS — for slush pump manifolds, mud lines, steam lines, fuel, and water lines.

BIG INCH COUPLING WITH BLANKING PLUG — the original slush pump suction union and blanking plug for compounding pumps.

SLUSH PUMP SUCTION STRAINER — keeps trash out . . . life in . . . pump valves and seats.

FLEXI-BALL JOINT — keeps mud lines and rotary hose out of a bind and facilitates making up misaligned connections.

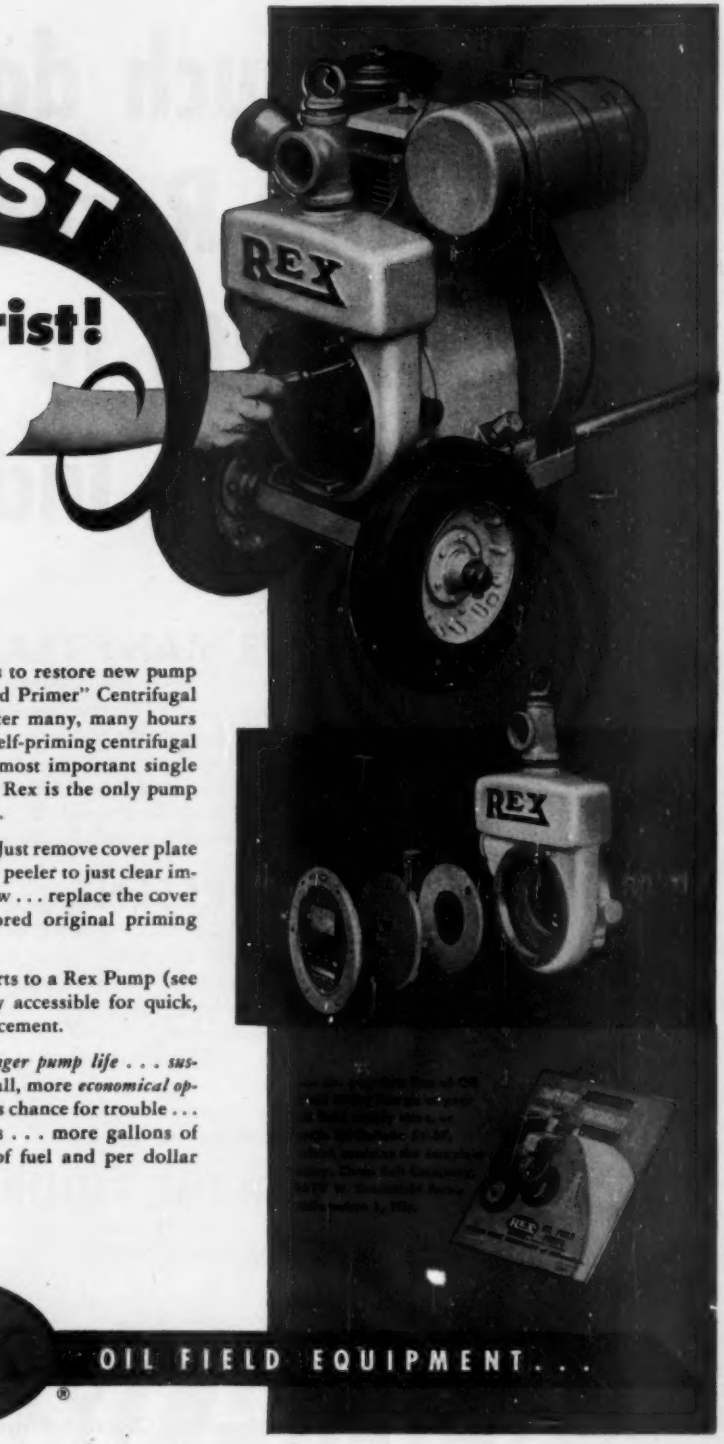
POSITIVE CHOKE BODY — for safe, dependable mud choke manifold service.

THORNHILL-CRAVER COMPANY

P. O. BOX 1184 HOUSTON, TEXAS

keep **UNIBOLT** *in mind when you're rigging up!*

just a TWIST of the wrist!



. . . That's about all it takes to restore new pump efficiency to the Rex® "Speed Primer" Centrifugal Self-Priming Pump even after many, many hours of rugged service. In every self-priming centrifugal pump, the air peeler is the most important single factor in priming efficiency. Rex is the only pump with an *adjustable* air peeler.

HERE'S HOW SIMPLE IT IS! Just remove cover plate . . . remove one bolt . . . drop peeler to just clear impeller . . . tighten the setscrew . . . replace the cover plate . . . and you've restored original priming efficiency.

There are only 6 basic parts to a Rex Pump (see illustration) . . . all readily accessible for quick, easy maintenance and replacement.

This simplicity means *longer pump life . . . sustained efficiency* and, above all, more *economical operation*—with Rex there's less chance for trouble . . . far lower maintenance costs . . . more gallons of liquid pumped per dollar of fuel and per dollar of cost.

OIL FIELD EQUIPMENT . . .

Q How much does Du Pont Research contribute to the Petroleum Industry?

A **FOR MANY YEARS** Du Pont research activities have *led* in the development of gasoline additives. It was a group of Du Pont engineers and chemists who, in 1923, worked out the first safe, efficient method for making tetraethyl lead antiknock compound on a commercial scale. Since then Du Pont has developed gasoline antioxidants, dyes and Metal Deactivator, as well as a number of grease stabilizers and fuel and lube oil additives.

AT PRESENT, the Du Pont Petroleum Laboratory, the 5 Du Pont Petroleum Chemicals Division district laboratories and the Du Pont fleet of road test cars and trucks are constantly at work on the investigation of petroleum problems. In addition, the research facilities of the Du Pont Company —including the Du Pont Experimental Station—are available to supplement the work of the Petroleum Laboratory. And such Du Pont products as neoprene, seismic explosives, tank farm paints and many other products widely used in the petroleum industry are also results of Du Pont research.

FOR THE FUTURE, too, you can look to Du Pont's recently expanded Petroleum Laboratory for new developments resulting from petroleum additives research.

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Better Things for Better Living
. . . through Chemistry

Petroleum Chemicals

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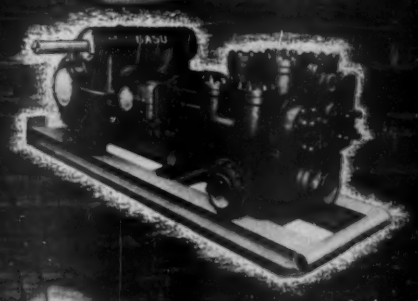
THE BLUE WHALE, WORLD'S LARGEST LIVING CREATURE

GASO World's Best Known Portable Pumps



The fame of the blue whale rests on the fact that it is the largest of all creatures alive or extinct—100 feet long and weighing 150 tons.

The fame of GASO PUMPS lies in the fact that they do a whale-size job with minimum size and weight. Completely dependable, unbelievably durable, they have for more than a third of a century supplied everything that the pipeline engineer wants in flexible, portable and salvable pumping units.

It's performance and performance alone that makes GASO PUMPS so predominantly first in the favor of pipeline men.

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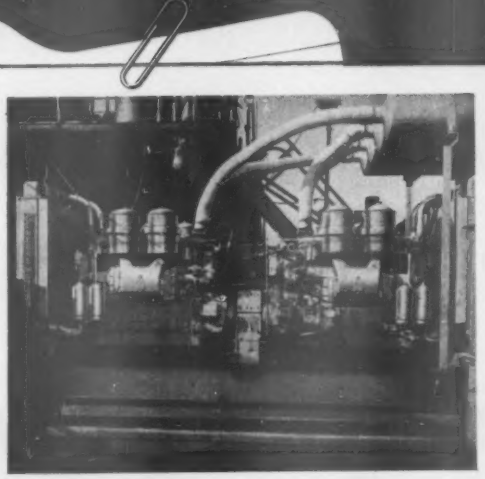
GASO PUMPS

for every oil industry need

GM DIESEL
CASE HISTORY No. 5111-14
USER: Glasscock Drilling Company, Corpus Christi, Texas
INSTALLATION: More than 80 GM Diesels, powering the majority of Glasscock's drilling rigs and offshore crew boats.
PERFORMANCE: Company states "over four years of continuous drilling with our GM Diesels has developed conclusive proof of the dependability and economy of GM Diesel engines."



"This Diesel proved itself for us"

GM
GENERAL MOTORS
DIESEL POWER

Redwater - Smackover - Magnolia - East Texas - Levelland - Rangely - Th
Diamond M - Refugio - Slaughter - KMA - Eunice, S - Ringwood - Silica -
- Hugoton - Tepetate - Robinson Main - Hobbs - Frannie - Monument - Yates -
Conroe - T- - - - Chase - Kern River - Scholem - Aleichem - Hull
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Fox - Car - Seminole - Weeks Island - Signal Hill - Alice
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We've run logs by the dozens in all these fields... (not to mention more than 3,000 wildcats)

In running more than 40,000 Radioactivity Well Logs, we've probed, recorded and studied the underlying structures of nearly every active oil field in this country... plus many fields in four foreign countries. Many operators can testify to the value of that comprehensive experience in providing skilled and accurate interpretation when desired by the operator. That knowledge and experience is one important reason why operators depend on Lane-Wells Radioactivity Well Logging as an accurate guide to the best possible completion on any well.

20 years of Progress through Service

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You can't argue with facts, figures, and performance. The above scene was made in a producing field near Yale, Oklahoma, which was electrified during the past year. It is operated by one of the Major Oil companies. Figures show that the average cost per day for six wells is 37c each. You can't beat that for economy's sake. Nor can you beat *PEP for safety and dependable operation. Investigate today — maybe you're losing money by not taking advantage of Electric Power. Contact the Power Engineer of your nearest Electric Power company for details on how *PEP can do a real job for you.

*PEP — Purchased Electric Power

Petroleum Electric Power Association

ORGANIZED IN THE INTEREST OF GREATER SERVICE TO THE PETROLEUM INDUSTRY

CALL YOUR NEAREST ELECTRIC SERVICE COMPANY FOR MORE FACTS

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in WIRE ROPE, too, longer life depends on the RIGHT KIND of muscle

Massive, muscular structure gives the elephant the overpowering strength he needs to ward off the attacks of predatory enemies. Even in a hostile environment, these huge animals may stretch out their life span to well over a hundred years.

In wire rope, too, prolonged life is dependent on specialized muscles that will give best resistance to the destructive forces encountered... whether they be abrasion, bending fatigue, load strain or shock stress. That is why in Wickwire Rope we make sure that you get the right grade of steel and size of wire... the right construction and lay of the rope... in short, the right kind of muscle for your particular job.

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9601

A STABLE ARC, GOOD DIRECTIONAL CONTROL, AND WIDE USEABILITY CHARACTERISTICS ENABLE YOU TO . . .

Weld Stainless Easily in ALL Positions with G-E Stainless Steel Electrodes

36 TYPES ASSURE YOU OF THE RIGHT ELECTRODE FOR EVERY JOB

You get the most for your dollar when you buy General Electric stainless steel electrodes. Here are seven reasons why:

1. You get excellent handling characteristics in *all positions.*
2. You get good directional control because G-E stainless steel electrodes give you a very stable arc.
3. You get the minimum of spatter and can remove slag easily.
4. You can select the correct electrode for every application because G.E. offers industry a complete line of chrome and chrome-nickel types.
5. You can get G-E stainless steel lime-coated electrodes for reverse polarity DC and titania-coated rods for AC and reverse polarity DC.
6. You get the correct metallurgical deposit your specific job requires.
7. You get excellent physical properties in the bead itself.

See Your G-E Welding Distributor!

He can help you select the best, most economical electrode for your specific stainless steel welding job.

Your G-E welding distributor also carries a complete line of other electrodes, accessories, AC, DC, Inert-Arc and Atomic Hydrogen welders. You can find his name by looking for General Electric under "Welding Equipment" in the classified pages of your telephone directory. ***General Electric Co., Schenectady 5, N. Y.***

712-19

SMOOTH, NEAT WELD made with lime type W-1310, reverse polarity DC electrode.

VERTICAL FILLET weld made with W-2310, titania type, AC or DC reverse polarity.

GENERAL ELECTRIC

"DOWNTIME-SAVERS"

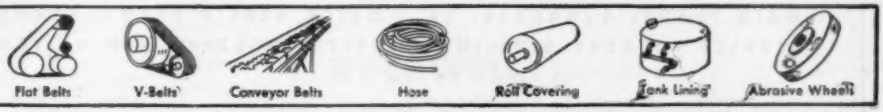
Condor V-BELTS

You save downtime for belt take-up and belt replacement when you use Condor V-Belts. There are good reasons . . . Condor V-Belts are destretched and balanced by R/M engineering during manufacture . . . and they are made with straight sidewalls for more grip. As a result, each Condor V-Belt in a multiple drive pulls its share of the load without stretching, sagging or slipping. That's why, all Condor V-Belts run longer, save time and money • Bulletin 6868-E, "Grips the Grooves," describes other advantages of the "Smoothest Running V-Belts Made." Write for it, or call your R/M Distributor.

R M

MANHATTAN RUBBER DIVISION — PASSAIC, NEW JERSEY

RAYBESTOS-MANHATTAN, INC.



Other R/M products include: Industrial Rubber • Fan Belts • Radiator Hose • Packings • Brake Linings • Brake Blocks • Clutch Facings • Asbestos Textiles • Sintered Metal Parts • Bowling Balls

integrity

Avondale

service...

famous in the Oil Industry

A company is not only famous for what it does—but also for how it does it! AVONDALE has constructed, repaired, and fabricated for the Oil Industry for many years. AVONDALE barges, towboats, tugboats, drilling barges, personnel launches and offshore drilling platforms have made a name for themselves within the Oil Industry as being tops in Quality and Performance. But that's not all! AVONDALE'S satisfied customers within the Oil Industry, both large and small companies, are proof that AVONDALE integrity, the manner in which AVONDALE carries out a job to the letter, to the complete satisfaction of the customer, is something that has made customers return to AVONDALE time and again. Couple those two words, Integrity and Service, and you have the ultimate in what the Oil Industry needs and wants from a company rendering Service to them . . . . . .

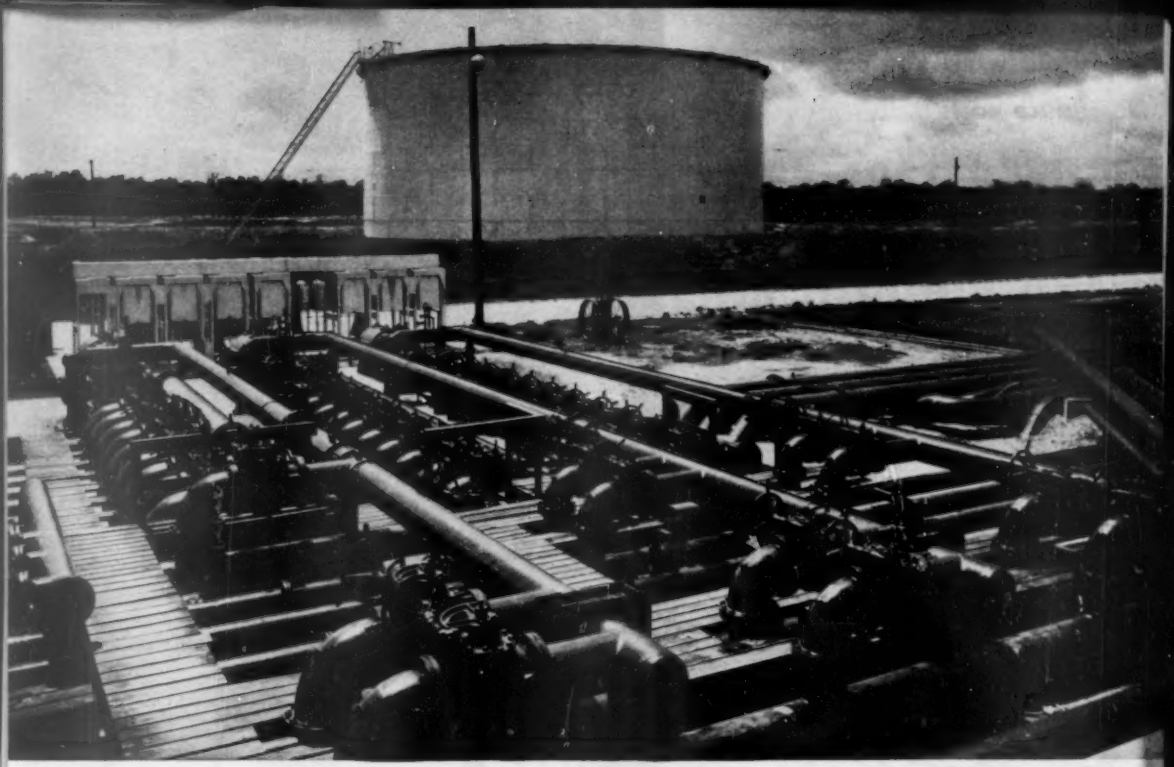
Offshore Drill Rig

125' MV "JOAN E."

Oil Cargo Barge

AVONDALE MARINE WAYS, Inc.

MAIN PLANT: AVONDALE, LA. • QUICK REPAIR PLANT: HARVEY, LA.
SERVICE FOUNDRY DIVISION (SERVICE FOUNDRY): NEW ORLEANS, LA.



Crude Oil Manifold Proves Nordstrom Superiority

IMPORTANT NEWS for NORDSTROM HYPRESEAL VALVE USERS

Now Nordstrom Hypreseal valves can be lubricated by hand gun, bucket pump or manually ***without interchanging parts.*** The new Rockwell Fitting, a combination lubricant screw and giant button head fitting, is now furnished at no additional charge with all Nordstrom Hypreseal valves. This new feature saves you the expense and bother of purchasing fittings for hand gun or bucket pump lubrication. Contact your Nordstrom representative for further details.

In a crude oil pumping manifold the superiority of Nordstrom valves soon becomes evident. There are many advantages of Nordstrom valves . . . no contamination of product . . . a quick quarter-turn opens or closes them . . . there are no seating area cavities to clog with line sediment . . . the patented Nordstrom internal lubrication system spreads a sealing film around the seat ports for double tightness and hydraulically jacks the plug for easier operation . . . there are special Nordstrom lubricants for every oil field service . . .

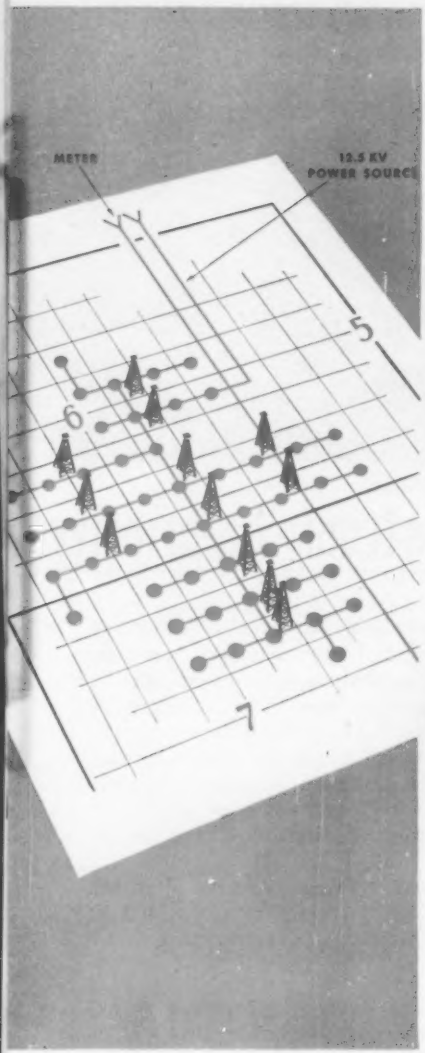
In short, Nordstroms are most economical in the long run. Rockwell Manufacturing Company, 400 N. Lexington Avenue, Pittsburgh 8, Pennsyvania.

Wherever you are in the oil fields, there is a supply store with Nordstrom valves and Nordstrom service nearby.

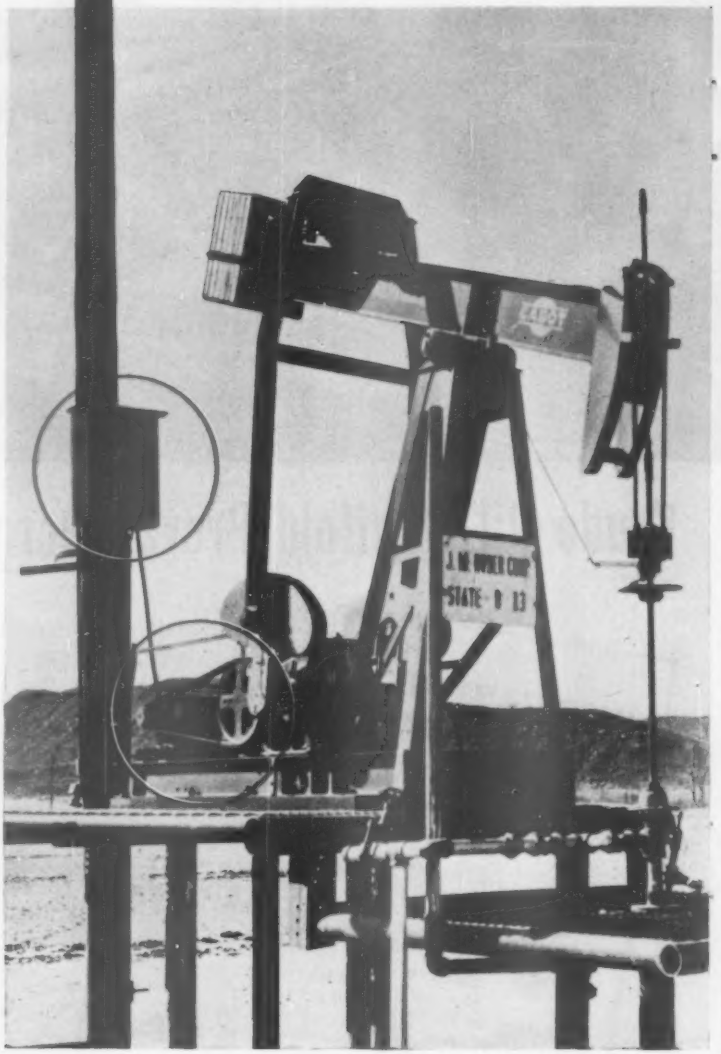
ROCKWELL Another Product **Built Nordstrom Valves**

LUBRICANT SEALED FOR POSITIVE SHUT-OFF

They did what you can do to reduce costs



Cost of the complete power line for these 49 Oklahoma wells was only $378 per well. Pumping cost is only 4.1c per bbl.



This Westinghouse-equipped pumping rig operates in *blowing sand* in a dry river bed. However, it has given 100% performance!

An opportunity for major cost savings in petroleum production

Have you really studied the dollar and cents advantages of electrified pumping? Look at these two examples from the Westinghouse files.

Operates under severe conditions

The photo at left shows a rig mounted on stilts in a dry river bed in Texas. The service conditions are terrible—sand blows constantly except during the rainy season when the river bed floods. Yet the Westinghouse motor and automatic time control have given 100% performance since they were installed two years ago. They haven't even required contact replacement. The automatic control cuts the motor in and out as desired, with just a rare check by the pumper.

Pumps 49 wells for only 4.1c per bbl

But you don't have to have unusually severe conditions to make electrified pumping pay. A study of 49 wells in the Healdton field in Oklahoma, shows pumping costs of *only 4.1c per bbl.* Westinghouse automatic time control staggers the pumping load so that power load is just 47% of total connected load. The whole 49 wells are handled by one combination pumper-electrician. And the installed cost of the power line was only $378 per well, including transformers.

Call Westinghouse for planning help

Determining the best pumping method over the long run requires a careful economic analysis. It's a costly mistake to select equipment simply on the basis of what is easiest or cheapest to set up initially. Westinghouse would like to help you make the type of study that will show whether *you* can make major cost savings in your petroleum production. Call us in.

DO YOU HAVE YOUR COPY of this valuable guide on oil well pumping? Write for B-4039, "Electrified Oil Well Pumping," Westinghouse Electric Corp., P.O. Box 868, Pittsburgh 30, Pa.
J-94908

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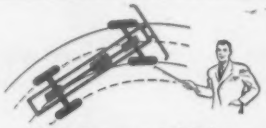
Advantages like these help you

Get More Productive Time!

Speed your oil explorations with this light-duty Model LD that moves equipment and supplies to any location

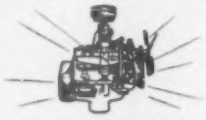
Proper Weight Distribution

Only a true 4 x 4 gives you up to 50% of the weight on the front wheels. This gives you the extra traction needed to work in any footing, any weather.



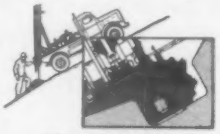
Fully Compensated Drive

Three free-acting differentials compensate for the differences in travel of all four wheels. Reduces drive line strains, eliminates needless tire scuffing.



Real Truck Engine—Real Truck Parts

The FWD LD is designed and built for rugged use . . . pays off in more productive time, fewer breakdowns in field.



High-Climb Oil Sump

Keeps oil pump constantly submerged. An FWD exclusive that lets you drill holes on the steepest grades.

A Leader for Geophysical Service

The LD is the answer for work which conversions and conventional trucks have long sought to do. As a water carrier it makes more trips daily, as a drill truck it reaches more locations, drills more holes daily. Can also be equipped as a shooting or recording truck, or to haul equipment and supplies.

Created (Not Converted) as a True 4-Wheel Drive, the LD gives you all the advantages of proper distribution of weight and power. The LD will travel over terrain that stops other trucks . . . it drastically cuts trip-time . . . helps maintain faster schedules . . . and earns more for your equipment dollar. Your FWD dealer will be happy to give you all the facts on the versatile LD . . . and the other great FWD 4 x 4 or 6 x 6 "mobilized tools" for the oil industry. Contact him or write FWD direct. The Four Wheel Drive Auto Co., Clintonville, Wisconsin. *Canadian factory,* Kitchener, Ontario.

Built by the makers of America's Foremost Heavy-Duty Trucks

Check List

for selecting a Piping Contractor

Listed below are a number of important factors that should be taken into account whenever you select a piping contractor. If any of these are overlooked, you are *not* buying your piping construction to best advantage.

☐ **EXTENSIVE SIMILAR EXPERIENCE** • Is the contractor thoroughly experienced on your type of work? Problems are always more readily solved when they have been met before.

☐ **MODERN FABRICATING PLANTS** • Fully equipped plants staffed by piping experts mean practical piping subassemblies that are correctly planned and prefabricated to simplify and expedite field erection.

☐ **PROGRESSIVE ORGANIZATION** • You want a contractor who keeps abreast of new piping developments. Piping research on a continuous basis should be his policy.

☐ **CONVENIENT LOCATION** • A fabricating plant near enough to give you quick service is of prime importance. Convenient location also improves overall supervision of the job.

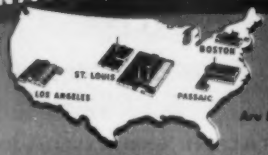
☐ **SUPERIOR FIELD FACILITIES** • A job of any size needs a resident superintendent with a permanent staff of supervising erectors. Welders should be qualified on your materials.

☐ **PLUS SERVICES** • The experienced contractor often can make suggestions that result in improved piping design and savings in time and money.

4586

You can check all these when you select MIDWEST

MIDWEST PIPING SERVICE IS NATION-WIDE



4 Plants Are Better Than 1

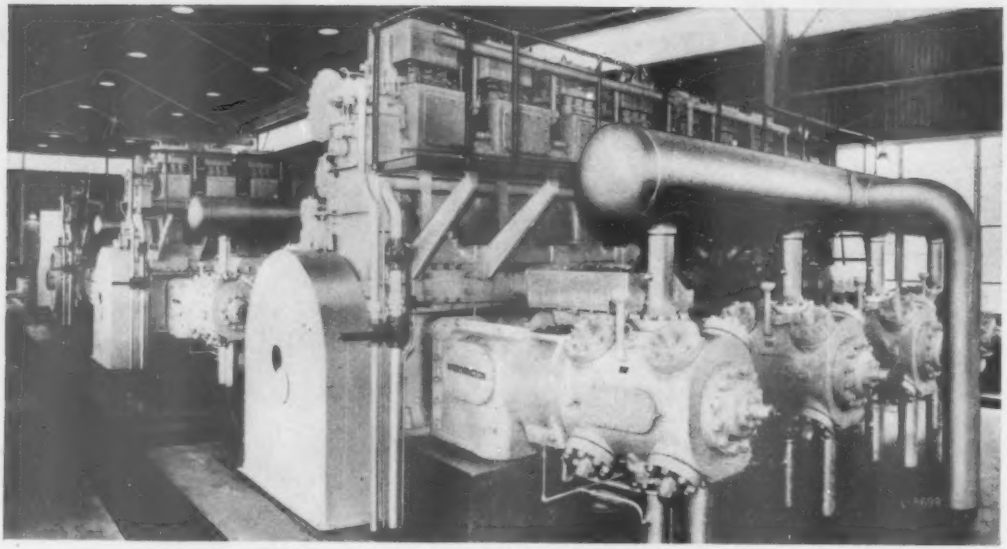
PIPING FABRICATORS AND CONTRACTORS

MIDWEST PIPING & SUPPLY CO., INC.

Main Office: 1450 South Second Street, St. Louis 4, Mo.

Plants: St. Louis, Passaic, Los Angeles and Boston

Sales Offices: New York 7—50 Church St. • Chicago 3—79 West Monroe St.
Los Angeles 33—520 Anderson St. • Houston 2—1213 Capitol Ave.
Tulsa 3—224 Wright Bldg. • Boston 27—426 First St.



WORTHINGTON UTC's "on the line" at the Buckley compressor station of Arkansas Louisiana Gas Co., Blanchard, La.

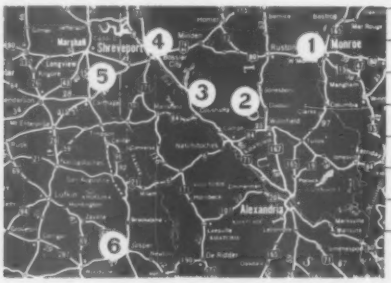
The Worthington count in the Shreveport area—

35 pipeline compressors to produce 53,000 bhp for five companies

Five leading gas-transmission companies have installed in the immediate Shreveport area alone a total of 35 Worthington UTC Engine-Compressor units with a combined output of 53,000 bhp.

What makes this Worthington Uniflo Angle Gas Engine Compressor so popular? Take a look at the features and draw your own conclusions: *complete removal of exhaust gas . . . more thorough charging with gas and air . . . positive timing for optimum combustion . . . effective supercharging . . . carbonization prevented by low operating temperatures . . . harmful cylinder stresses eliminated as uniform temperature results in equal cylinder wall stresses.*

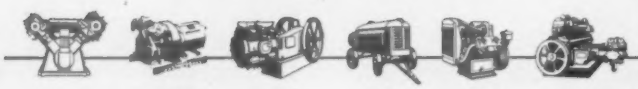
Take advantage of this great improvement in Engine Compressors for gas transmission. For more facts, write to Worthington Corporation, Engine Division, Buffalo, New York.



No.	Station	Total hp	Customer
1	Station 6, West Monroe, La.	12,800	Tennessee Gas Trans. Co.
2	Bienville Station	4,800	Southern Natural Gas Co.
3	Koran Station	4,000	United Gas Pipeline Co.
4	Buckley Station	7,000	Arkansas-Louisiana Gas Co.
5	Marshall Station	10,000	Texas-Illinois Natural Gas Pipeline Co.
6	Station 4, Jasper	14,400	Tennessee Gas Trans. Co.

COMPRESSOR STATIONS in operation or on order using Worthington UTC-Engine Compressors.

EK.2.8



NO OTHER COMPRESSOR WILL OUTPERFORM A WORTHINGTON

WORTHINGTON

Engine Compressors

The finest welding fittings available are made from seamless steel tubes forged in Globe's Foren Mill . . . the only one of its kind in the entire Steel Tube Industry.

NOW... get immediate delivery on GLOBE welding fittings...

the only seamless welding fittings precision processed from billet... to tube... to fitting

NOW — you can schedule immediate delivery on the finest welding fittings made today. Globe fittings — the only fittings manufactured through a continuous precision process that begins with the making of the seamless tube and continues through to the production of finished fittings.

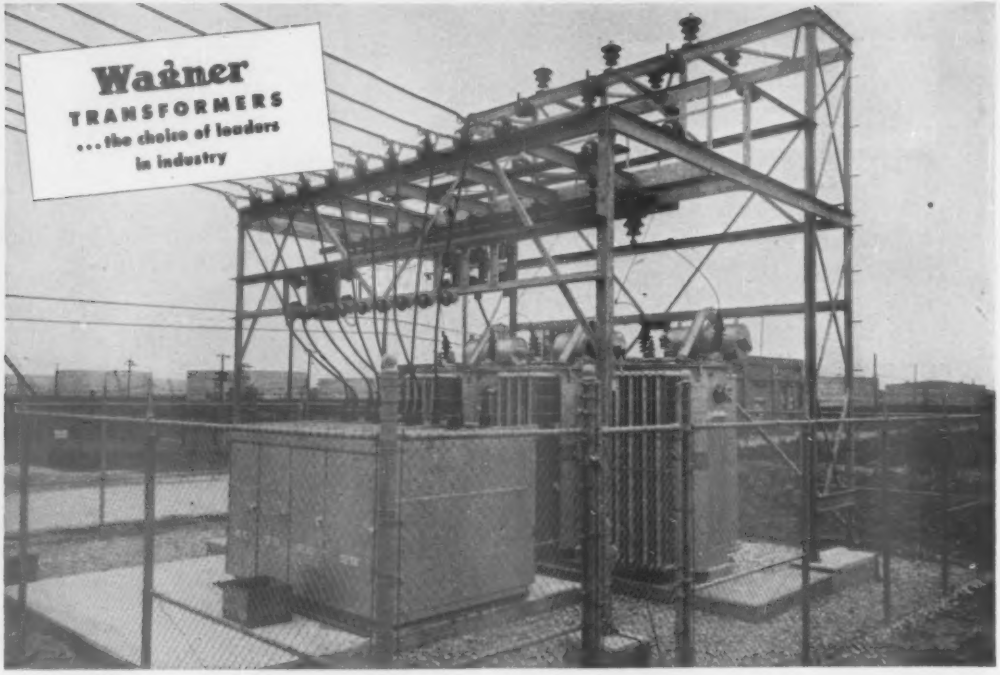
The exacting controls employed in this process — plus specialized research, testing and engineering insure uniform high quality and close tolerances. So, for the finest in welding fittings — order now — specify Globe—*and get immediate delivery.*

For complete information on the finest welding fittings available anywhere, send for the Globe Welding Fittings Catalog.

GLOBE STEEL TUBES CO., Milwaukee 46, Wisconsin

Chicago • Cleveland • Detroit • Philadelphia • St. Louis • New York
Denver • Houston • San Francisco • Glendale, Cal.

Producers of Globe seamless stainless steel tubes — Gloweld welded stainless steel tubes — alloy — carbon — seamless steel tubes — Globeiron (high purity ingot iron) seamless tubes — Globe Welding Fittings.



to keep the wheels of progress turning

The wheels of progress literally depend on petroleum products to keep them turning. Petroleum products, like those of The Texas Company, provide fuel for motive power, lubricants to help overcome friction, coolants to speed production — as a few examples. A steady flow of these vital products from the refinery depends, in turn, on a steady flow of electricity—the power for production.

Wagner Transformers, like this bank of 2000 kva power transformers at the Port Arthur plant of The Texas Company, steadily feed electric power at the right voltage for use in this plant.

Wherever electric power is used, in industry, commerce, city and farm — Wagner Transformers can be found, handling their never-ending job of supplying proper voltages for every purpose with complete dependability.

Wagner engineers are qualified to specify the correct transformer for *your* requirements. Consult the nearest of our 32 branch offices, or write us.

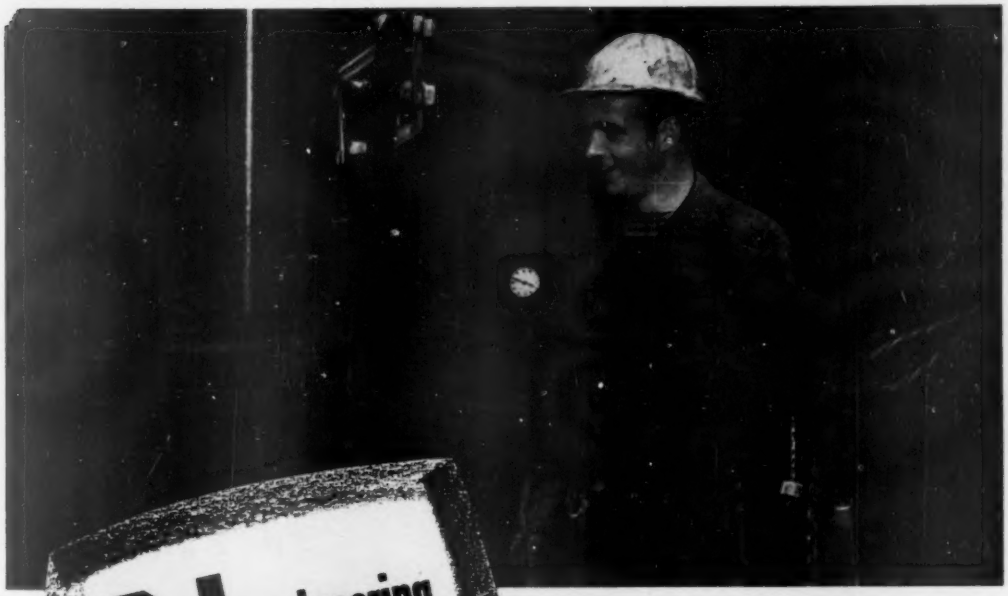
® Wagner Electric Corporation
EST. 1891

WAGNER ELECTRIC CORPORATION
6389 Plymouth Ave., St. Louis 14, Mo., U.S.A.

ELECTRIC MOTORS • TRANSFORMERS • INDUSTRIAL BRAKES
AUTOMOTIVE BRAKE SYSTEMS • AIR AND HYDRAULIC

BRANCHES IN 32 PRINCIPAL CITIES

T52-11



BJ engineering puts power to work for you...

POWAIRMATIC TUBING TONG

...fast, positive make-up and break-out

Here's how you save when BJ engineering puts *power* to work for you! When you use the BJ Powairmatic Tubing Tong you save on crew time... you increase safety... you get back on production faster!

Speed — the BJ Powairmatic has two power speeds — low gear for breaking out... high gear for fast spinning and make-up.

Accurate Make-Up — the BJ Torque Indicator — an exclusive feature — provides accurate torque readings which insure uniform make-up of the entire string.

Positive Power — permanently lubricated transmission gears power through chain drive to the rotating gripping mechanism... this provides positive grip without crimping.

Ease of Operation — automatic alignment and positioning for stabbing and removal... true-balance suspension... ONE-man operation.

Adaptability — interchangeable jaws and bushings handle tubing sizes from 1¼" to 3½" (4" O.D.)

You'll save crew time on the first stand you break out with this fast, powerful BJ tool. See the BJ Representative in your territory — or write today for new bulletin.

Byron Jackson Co.

MEANS ENGINEERED OIL TOOLS

This Simple Compressor Meets the Complex Needs of a Changing Petroleum Industry

It's the Nash!

Here is a compressor presenting advantages found in no other device. Nash Compressors have only one moving part, rotating without metallic contact with the pump casing. No internal lubrication is required. Yet they produce 75 lbs. pressure in a single stage, with capacities to 6 million cu. ft. per day in a single structure.

There are no valves, gears, pistons, sliding vanes, or other complicated wearing parts in a Nash. Compression is secured by an entirely different principle of operation. Because of this, gas pumping problems difficult with ordinary pumps are often easily handled by the Nash. For example, Nash Pumps are standard equipment in the Synthetic Rubber Industry, where they have met the needs of new and difficult processes.

Nash Compressors are compact and save space. They run without vibration, and compression is without pulsation. They maintain original performance over long periods. Service is assured by a nationwide net-work of Engineering Service offices. Instructive bulletin shows how they operate. Write for it.

One moving part.

No internal wearing parts.

No valves, pistons, or sliding vanes.

No internal lubrication.

Low maintenance.

Slugs of liquid entering pump do no harm.

Non-pulsating pressure.

Saves floor space.

75 pounds in a single stage.

NASH ENGINEERING COMPANY

274 WILSON, SO. NORWALK, CONN.

They're all SUPERIOR in my opinion!

Yessiree! Five Queens!

"Superior Sammy" can tell you the best buys in oil field supplies but he couldn't make up his mind which one of these five lovely girls should be chosen the winner so he picked them all! We feel the same way about all the customers we serve in the oil and gas industry—we give them our best in SUPERIOR SERVICE and we love them all!

P.S.—No, we don't have any names or addresses of the girls who posed for the above sketch . . . but the stores below can give you lots of help with your supply problems.

Our Stores and Offices are Located in:

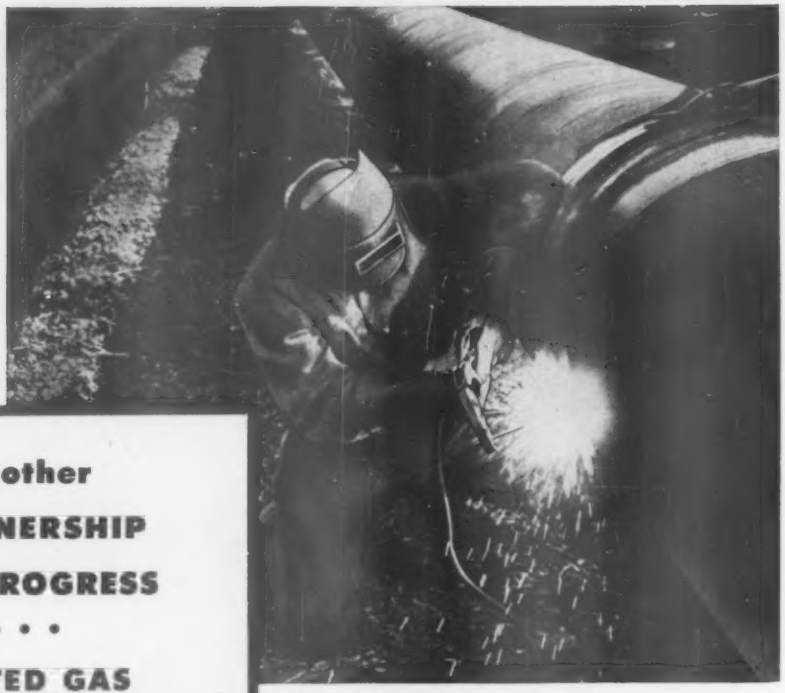
- Shreveport, La.
- Baton Rouge, La.
- Lafayette, La.
- West Point, Miss.
- Yazoo City, Miss.
- Tinsley, Miss.
- Camden, Ark.
- Magnolia, Ark.
- Tulsa, Okla.
- Dallas, Texas
- Abilene, Texas
- Midland, Texas
- Houston, Texas
- Carthage, Texas

New York Office — Room 1212, 502 Park Avenue — Telephone El Dorado 5-3572

Chicago Representative — Telephone Midway 3-6172

SUPERIOR IRON WORKS & SUPPLY COMPANY, INC.

GENERAL OFFICE: 1202-04 MARSHALL • P.O. BOX 1800 • SHREVEPORT, LOUISIANA



Another
PARTNERSHIP
FOR PROGRESS
• • •
UNITED GAS
PIPE LINE COMPANY

FIRST names in pipelines depend on the FIRST* name in line pipe

*FIRSTS by A. O. Smith: Welded line pipe • Internal expanded pipe Light wall large diameter pipe • World's largest producer of large diameter welded steel pipe

United Gas Pipe Line Company is now completing one of the largest construction projects in its history. Natural gas from new sources, including one 25 miles out in the Gulf of Mexico, will be gathered in new lines and main arterials to enlarge and reinforce this great producing and distributing system.

A. O. Smith Corporation's contribution to the completion of this huge program will have been the shipment of some 500 miles of 30 inch diameter and more than 300 miles of 18 inch to 26 inch diameter line pipe from its Milwaukee and Houston Works.

It is in such partnerships for progress . . . that A. O. Smith research, and engineering and precision manufacturing play their vital roles in aiding the development of the petroleum and natural gas resources of America.

A.O. Smith Line Pipe is available in a complete range of sizes and wall thicknesses, from 8⅝-in. to 36-in. diameters

DEPENDABILITY
through **RESEARCH**
and **ENGINEERING**

78th ANNIVERSARY 1874 - 1952

A.O.Smith
LINE PIPE • CASING

Chicago 4 • Dallas 2 • Denver 2 • Houston 2
Los Angeles 22 • Midland 8, Texas
New Orleans 12 • New York 17 • Pittsburgh 19
San Francisco 4 • Seattle 1 • Tulsa 3
Washington 6, D.C. • International
Division: P.O. Box 2023, Milwaukee 1, Wis., U.S.A.

IT'S PACKED
WITH SATISFACTION
WHEN IT'S PACKED
WITH **R/M**

Whatever your packing problem . . . gaskets for a Freon condenser like this one . . . or packings for service against high pressures, high temperatures, chemicals, refrigerants, petroleum, milk or other special fluids . . . Raybestos-Manhattan has a packing or gasket designed for the job. Check your R/M Packing Catalog, or call your nearby R/M distributor.

R/M

PACKINGS

FOR R/M "TEFLON" PACKINGS, GASKETS, SHEETS, RODS, TUBES, SEE YOUR R/M DISTRIBUTOR

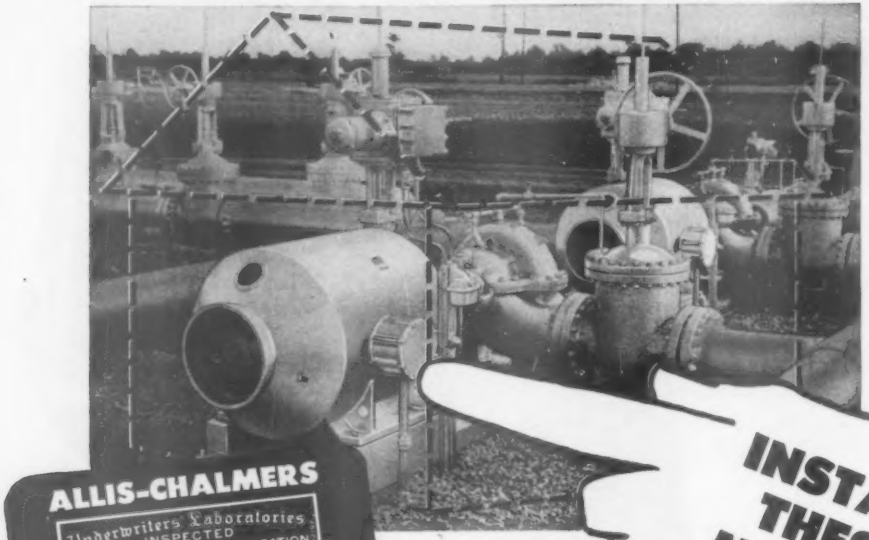
RAYBESTOS-MANHATTAN, INC.

PACKING DIVISION, MANHEIM, PA.

FACTORIES: Bridgeport, Conn.; Manheim, Pa.; No. Charleston, S.C.; Crawfordsville, Ind.; Passaic, N.J.; Peterborough, Ontario, Canada

RAYBESTOS-MANHATTAN, INC., Manufacturers of Packings • Asbestos Textiles • Mechanical Rubber Products • Abrasive and Diamond Wheels • Rubber Covered Equipment • Brake Linings • Brake Blocks • Clutch Facings • Fan Belts • Radiator Hose • Sintered Metal Products • Bowling Balls

No building to buy!



YOU CAN ELIMINATE costly building on many different kinds of installations by using Allis-Chalmers Tube-type, Explosion-proof Motors and installing them outdoors. The motors shown here operate outdoors all year round at a midwestern pipe line booster station. Rain, snow, dirt, the weather's worst conditions, do not affect their dependable operation. And the same kind of savings can be made in hundreds of other applications in the field, on pipe lines and in the refinery.

Self-Cleaning Feature Saves Maintenance

The cooling system in this unique motor is practically self-cleaning. Cooling air is blown through straight, smooth tubes at sufficient velocity to clean out ordinary dirt, even after long shutdowns. There are no corners or pockets to trap dirt or moisture. If sticky dirt clings, a ramrod will clean the tubes in seconds without stopping the motor.

On any type of duty, indoors or out, Allis-Chalmers Tube-type, Explosion-proof Motors reduce maintenance by keeping themselves clean. Get full details from your Allis-Chalmers Authorized Distributor or District Office. Or write Allis-Chalmers, Milwaukee 1, Wis., asking for bulletin 51B7149.

A-3696

Texrope and *Vari-Pitch* are Allis-Chalmers trademarks.

ALLIS-CHALMERS

Sold . . .
Applied . . .
Serviced . . .

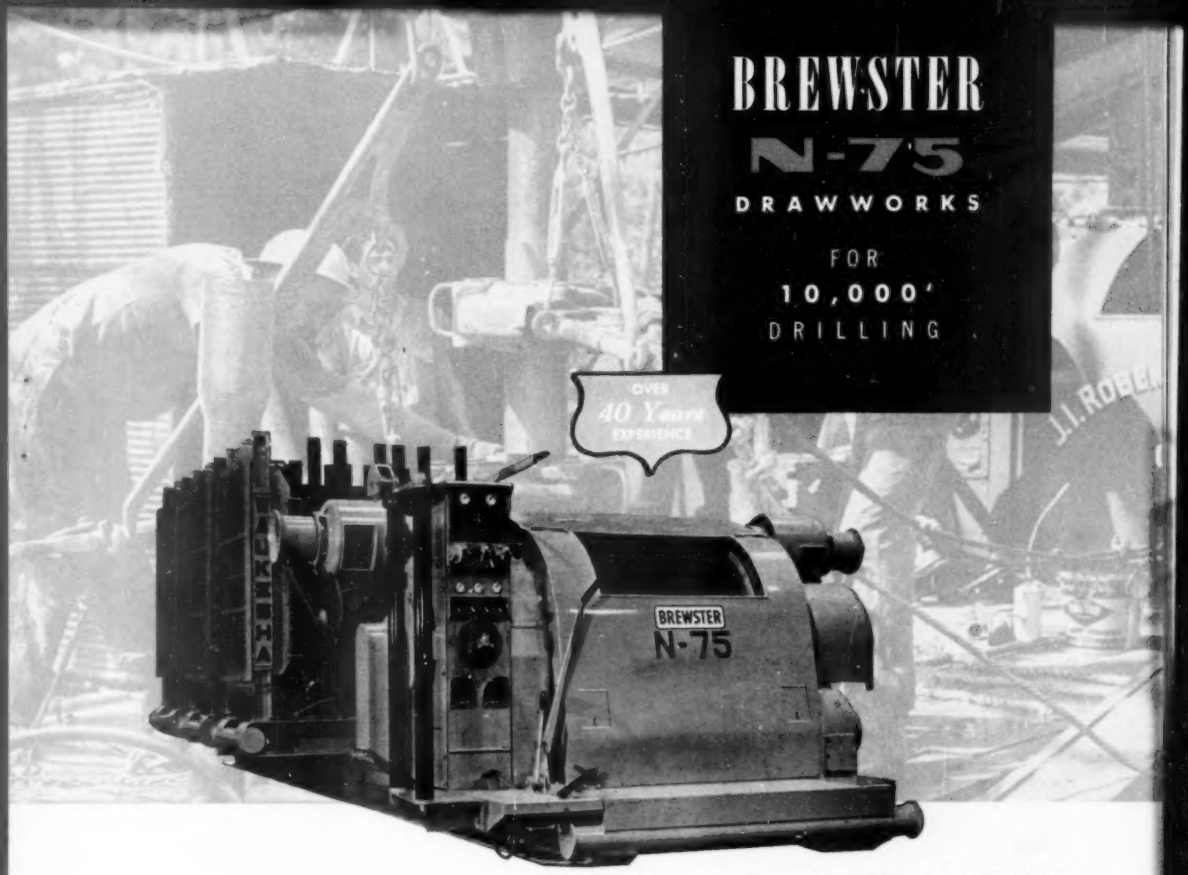
by Allis-Chalmers Authorized Dealers, Certified Service Shops and Sales Offices throughout the country.

CONTROL — Manual, magnetic and combination starters; push button stations and components for complete control systems.

TEXROPE — Belts in all sizes and sections, standard and *Vari-Pitch* sheaves, speed changers.

PUMPS — Integral motor and coupled types from ¾ in. to 72 in. discharge and up.

BREWSTER N-75 DRAWWORKS FOR 10,000' DRILLING



THE N-75 IS A COMPACTLY DESIGNED RIG

Drawworks and compound are mounted on H-Beam skid base with provisions for mounting 2 or 3 engines.

40 years accumulated experience of Brewster engineers and field technicians have been built into the Brewster N-75 drawworks. This rig, newest development of Brewster's oldest drawworks, incorporates the sound principles of other Brewster equipment. More power has been built into the N-75, with the latest improvements in drum and clutch design for faster, deeper drilling.

Ask your nearest Brewster supply house about the newest Brewster drawworks, the N-75.

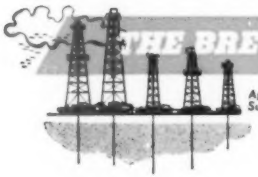
THE N-75 FEATURES

Larger and longer drum core

Extra large chains on high and low drum drives

Increase in power from 600 to 700 horsepower

Auxiliary positive clutch built into low drum friction clutch



THE BREWSTER COMPANY, INC. SHREVEPORT, LOUISIANA

BREWSTER DRILLING EQUIPMENT

Apex Equipment Co. • Murray Brooks, Inc. • Reams Supply Co. • Bovaird Supply Co. • Industrial Supply Co. • In Canada: Rocky Mountain Supply Co. — Direct and through recognized export dealers.

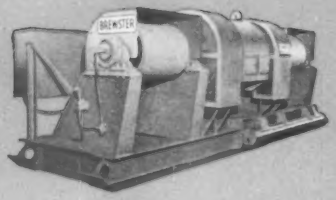
Chains* in the Brewster compound are well lubricated and operate on accurately cut sprockets.

Flexible power of the N-75 is air controlled from driller's position.

Over-all height of 62" affords maximum visibility of rig's operation.

**Chains for compound are selected for the service required to insure a longer chain life with a minimum fatigue failure.*

Brewster double pump drive unit optional on 2 or 3 engine compound.



SPECIFICATIONS FOR BREWSTER N-75 DRAWWORKS

Recommended Total Available Horsepower	700
Max. Dia. Drum Shaft SAE 4140 Alloy Steel	6¼"
Drum Flange Diameter	48"
Drum Spool Diameter x Length	21" x 40½"
Brake Lining Size	1" x 9"
Net Braking Surface (Lining) Square Inches	2376
High Speed Drum Clutch	Twin Disc Friction
Low Speed Drum Clutch — Positive Jaw and Twin Disc Friction Drum Drive Chains	1¾" Triple
Transmission:	
Max. Shaft Size	6¾"
Shaft Dia. in Bearings	4¾"
Chain Size	1¾" Double
Master Clutch	Twin Disc P-2-24 Friction
Reverse	2-Speed Gear
Rotary Clutch Size	Twin Disc P-2-18 Friction

Size Main Skid Members	14 x 14 H
Approx. Over-all Height	80"
Approx. Width of Skids	7'-0"
Approx. Weight of 2-Engine Drawworks, less Engines	45,500 lbs.
Approx. Weight of 3-Engine Drawworks, less Engines	50,000 lbs.

Transmission Speeds	Cathead Shaft RPM	Rotary Drive Sprocket RPM 27½" P	Low Speed Drum Drive Line Speeds and Pulls	High Speed Drum Drive Line Speeds and Pulls
Low	101	203	270'/Min. 72,000 Lbs.	970'/Min. 20,000 Lbs.
Second	148	297	395'/Min. 52,000 Lbs.	1,415'/Min. 15,000 Lbs.
Third	223	429	572'/Min. 36,000 Lbs.	2,050'/Min. 10,000 Lbs.
High	312	627	835/Min. 25,000 Lbs.	2,990'/Min. 7,000 Lbs.

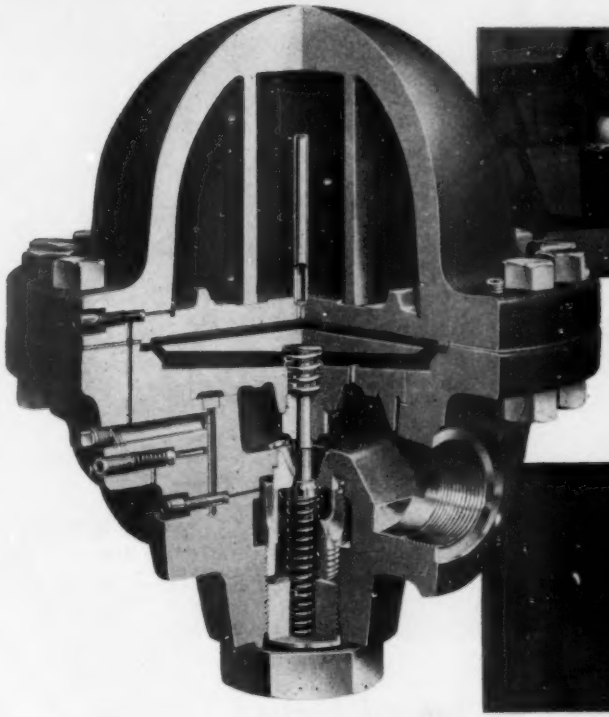
AUXILIARY DRILLING EQUIPMENT

200 TON TRAVELING BLOCK • 6-S OILBATH SWIVEL • RSH 18" ROTARY

THE BREWSTER COMPANY, INC.

SHREVEPORT, LOUISIANA

ACCURATE CONTROL of high pressures!



GROVE
Powreactor Dome REGULATORS
for air, gas and liquids

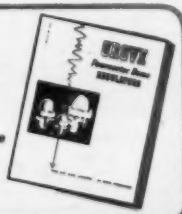
GROVE POWREACTOR DOME REGULATORS are designed for reducing initial pressures to the desired delivered pressure, maintaining this reduced pressure within extremely close limits. These ruggedly compact, precision-built regulators provide instantaneous automatic control of air, gas, oil, water and other liquids at pressures up to 6000 psi. Thousands of installations on pipe lines, gas wells, hydraulic hoists, bottled gas systems, diesel engines, chemical plants, ships, etc., prove Grove's superiority wherever fast, accurate, dependable control is required.

FEATURES:

SMALL, COMPACT
EXTREMELY SENSITIVE TO PRESSURE CHANGES
MAINTAINS CONSTANT DELIVERED PRESSURES
COMPLETE RANGEABILITY
POSITIVE, TIGHT SHUT-OFF
NO CHATTERING, PULSATING OR POUNDING
QUICK, EASY ADJUSTMENT
SINGLE-SEATED VALVE CONSTRUCTION
FEWER WEARING PARTS

GROVE

For complete technical information, see your nearest Grove Representative or write for Bulletin No. 123A-R1.



POWREACTOR DOME REGULATORS

GROVE REGULATOR CO.

64th and HOLLIS STREETS, EMERYVILLE, CALIFORNIA
649 SOUTH OLIVE STREET, LOS ANGELES 14, CALIFORNIA
1901 CALUMET, HOUSTON 4, TEXAS • 415 LEXINGTON AVE., NEW YORK 17, N. Y.
DISTRICT OFFICES: Dallas, Corpus Christi, Odessa, Texas, Lafayette, Louisiana, Tulsa, Oklahoma

From time card to travel ticket

Every angle completely covered . . . but one! When fire strikes during the night your skilled labor may go in the morning. The fully experienced Joes, Bills and Toms can't stand the financial strain of waiting . . . their time cards can become travel tickets to new jobs, while you're struggling to replace the ravages of fire.

The threat of losing your skilled labor due to an unexpected fire tragedy can be fully eliminated. With C-O-TWO Smoke or Heat Fire Detecting Systems plus C-O-TWO High Pressure or Low Pressure Carbon Dioxide Type Fire Extinguishing Systems your plant can have fast, positive, round-the-clock fire watchman service simultaneously at each fire hazard point.

At locations where a deep-seated, smoldering internal fire as well as a fast burning external fire might occur, the smoke detector of a C-O-TWO Smoke Fire Detecting System, based on an exclusive operating principle, automatically detects the first trace of smoke, smoldering or fire.

For locations where excessive heat or combustion might cause a flash fire, the heat detectors of a C-O-TWO Heat Fire Detecting System automatically sound a warning at the first flash of fire.

Then clean, dry, non-conducting, non-damaging carbon dioxide is instantly released from either a C-O-TWO High Pressure or Low Pressure Carbon Dioxide Type Fire Extinguishing System into the threatened area. The fire is out in seconds with little if any interruption to operations and the carbon dioxide disappears without a trace . . . one of the safest fire extinguishing agents known . . . harmless to equipment, materials and finishes.

WHEN BUSINESS STOPS . . . INCOME STOPS!

Don't take chances with your investment. Secure the benefits of highly efficient fire protection engineering today . . . our extensive experience over the years is at your disposal without obligation. Get the facts now!

C-O-TWO

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Squeez-Grip Carbon Dioxide Type Fire Extinguishers
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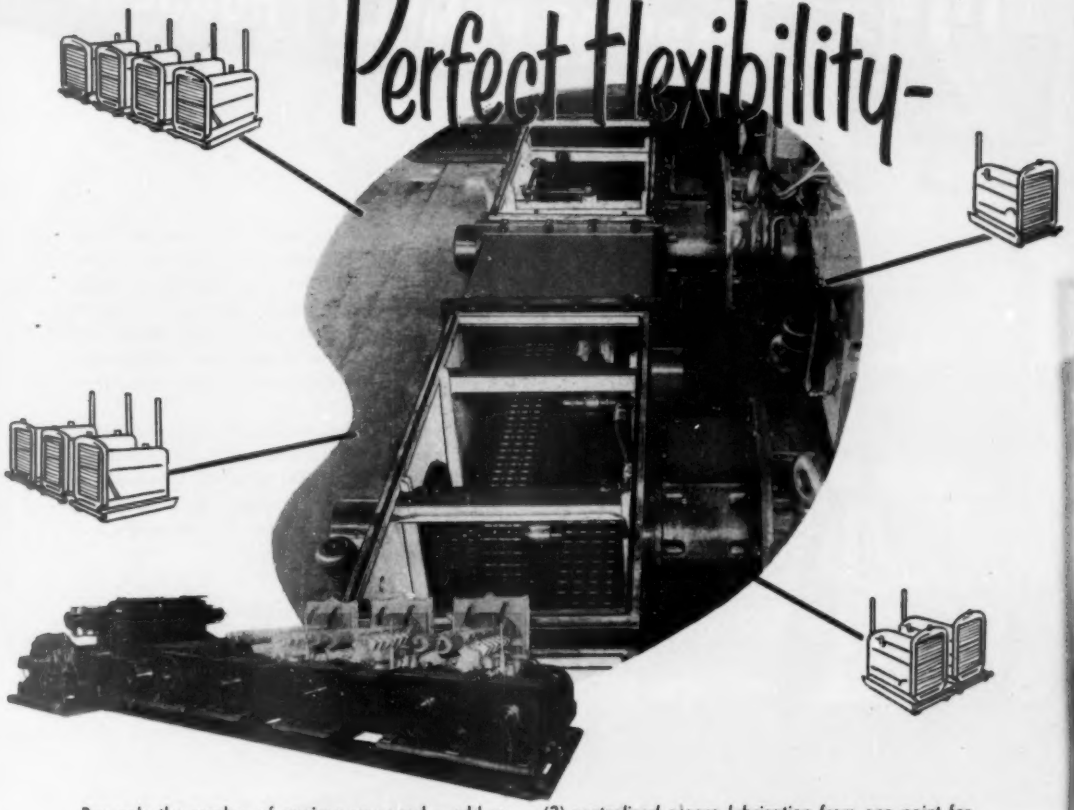
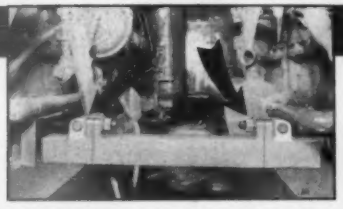
WILSON SECTIONAL PLATE TYPE COMPOUNDS OFFER

Perfect Flexibility-

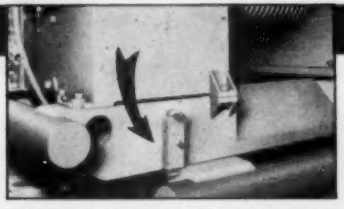


Buy only the number of engines you need — add as many, or remove as many engines as required — it makes no difference, if you're operating with a WILSON SECTIONAL PLATE TYPE COMPOUND!

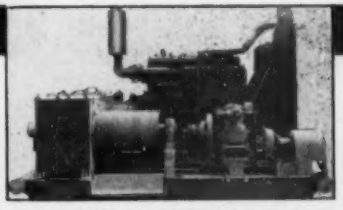
IMPORTANT FACTS — (1) *Each Compound section and engine is mounted as single unit;* (2) *each section is joined and perfectly aligned* by SPACER BARS and SLIDE BLOCKS (shown below)—developed by Wilson; (3) *centralized grease lubrication from one point* for each section; (4) *spray lubrication inside compound case;* (5) *heavy plate steel construction throughout;* (6) quickly removable cover permits access to any section in jiffy; and (7) the same compound can be used either with torque converters or without torque converters with completely satisfactory results. Only a change of sprockets on pump drive and transmission input are required.



WILSON SPACER BARS provide perfect spacing and parallel alignment. No adjustment or measurement necessary.



PERFECT CROSSWAYS ALIGNMENT of engines and compound section is assured through the use of WILSON SLIDE BLOCKS.



ACCESSORY SHAFT DRIVE — ideal for air compressor, water pump generator, etc. — is built into rear of compound.

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25 YEARS OF PUMPER PROGRESS

Since the earliest days of the industry, Parkersburg Rig & Reel Company has been a consistent contributor to the progress of oil well drilling and production.

In 1927, three years before the discovery of the great East Texas field, Parkersburg gave the industry the first improved pumping equipment of several decades. Simplicity of design . . . dependability of performance . . . rugged durable construction were the outstanding advancements of this new pumping unit.

These basic features for efficient, economical service, plus additional refinements for better performance and longer-life, have been brought to their peak in the latest types of Parkersburg Pumpers, which make them the industry's outstanding pumpers today.

PARKERSBURG RIG & REEL CO.
Parkersburg, West Va.

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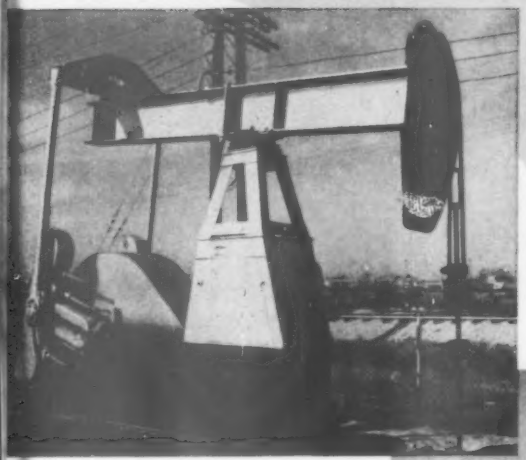


ABOVE — This early Parkersburg Pumper has been operating in the East Texas field at Kilgore for more than 20 years. Still in service today, it is a testimonial to long-life of Parkersburg Pumpers.

RIGHT — Latest type of Parkersburg Chain Driven Pumper on a West Texas location. This 54" stroke pumper is equipped with the new Parkersburg Crank Counterbalance and the newest type of chain drive.

PARKERSBURG
PUMPERS *Air Balanced • Chain Driven • Gear Driven*

Manufactured in Coffeyville, Kansas

GIVE YOUR OPERATOR THE OUTFIT

● Throughout the nation's oil fields, you'll find popular Bucyrus-Erie cable and hydraulic Bulldozers and Bullgraders on the job — digging slush pits, carving out access roads, backfilling . . . building dykes . . . grading around wells.

HE'LL GIVE YOU THE OUTPUT

BUCYRUS ERIE

BULLGRADERS and BULLDOZERS

With an easy-to-handle Bucyrus-Erie Bulldozer or Bullgrader your operator has a digging tool that's designed to give him the most in work capacity and safety — at a minimum of effort. For example:

He Sees What He's Doing . . . The operator can see exactly what the blade is doing — and stay seated. No superstructures to obstruct his vision.

. . . Is In Complete Command Center of gravity is kept low for greater stability when working on steep banks. Also with tractor balance point kept practically intact, blade doesn't tend to nose over at the edge of the dump, tractor works at top efficiency.

. . . And Comfortable Single, four-position hydraulic control lever is within easy reach of the operator, yet does not interfere with tractor controls. Winch control levers for cable-operated blades are easy to operate — conveniently located.

In addition, Bucyrus-Erie Bullgraders can be angled and tilted by the operator in a few minutes without special tools. Lubrication points are easily accessible. Your International Industrial Tractor distributor will be happy to give you full details.

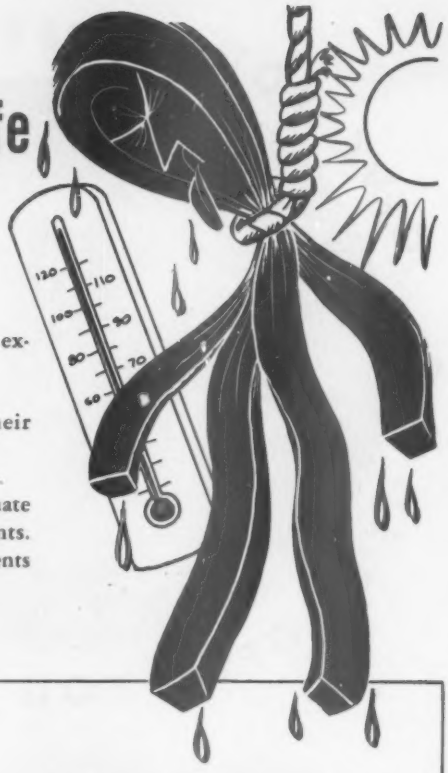
34T52

See Your INTERNATIONAL Industrial Tractor Distributor

BUCYRUS-ERIE COMPANY
South Milwaukee, Wisconsin

How to get More Life out of V-Belts

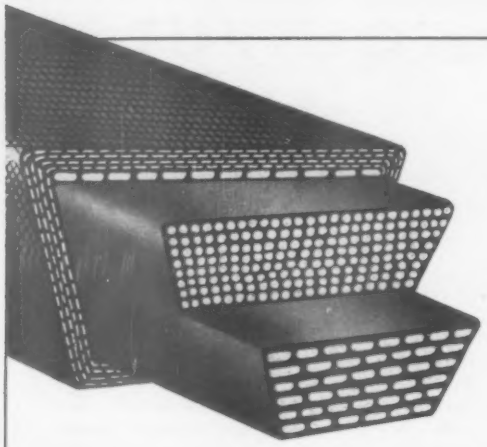
(STORAGE)



DON'T store V-Belts in a hot dry room or expose to the direct rays of the sun.

DON'T hang belts in such a way that their shape will be distorted.

DO specify and store *Bull Dog V-Belts* in adequate supply for your normal replacement requirements. With Bull Dogs on the job "normal" replacements are few and far between.



Your BWH distributor will be glad to show you how Bull Dog V-Belts have the covers, the cords and the compounds to cut *your* belting costs. Call him today.

HERE'S WHY

Their DURABLE COVERS withstand the severe wearing action of the sheave while sealing the belt against grease, dirt, moisture.

There's MINIMUM STRETCH due to a new, exclusive technique which results in fewer takeup adjustments, reduced slippage, longer belt life.

There's a STRONG, SPECIALLY ENGINEERED CORD SECTION with high tensile strength, increased load carrying capacity, ability to absorb shock loads.

The belt TAKES HEAVIEST FLEXING because BWH quality-controlled compounds run cooler and do not crack or deteriorate under severe flexing.

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Another Quality Product of

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Warehouse Stock: 111 N. Canal St., Chicago, Illinois **Distributors in all Principal Cities**

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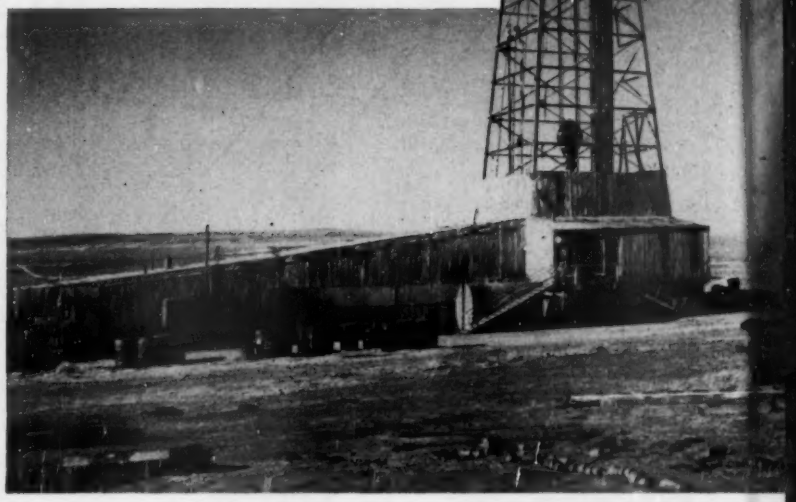
Here, in the deepest producing well in the world

it's NATIONAL SEAMLESS

CASING and TUBING



LOCATED 31 miles west of Casper, Wyoming, in West Poison Spider Unit No. 3, this well was recently completed to produce from the Morrison Sandstone at a depth of 16,102 feet. (T.D. before plug back, 16,603 feet).

All of the more than 16,000 feet of 7" O.D. casing and the 2" and 2½" tubing in this record breaking well was NATIONAL Seamless.

It is no mere happenstance that you'll find NATIONAL Seamless Tubular Products in the forefront of every advance made in drilling, refining and transportation of petroleum. For more than fifty years, whenever new records were in the making, NATIONAL Seamless drill pipe, casing and tubing has been called upon with confidence. Its established reputation for the utmost dependability has made it the logical choice whenever the job was unusual or tougher than ordinary.

That's because NATIONAL Seamless has developed hand in hand with the needs of the industry. How closely our research program has reflected and successfully met constantly more severe demands, is shown in the accompanying list of National Tube *firsts*. Here is a record of progressive achievement of which we are proud. For by continually giving you better and more efficient products it has benefited not merely ourselves but every oil man in America.

NATIONAL TUBE *firsts* IN OIL COUNTRY TUBULAR PRODUCTS

- Made the first steel pipe in the country
- First pipe with seamless couplings
- D. S. X and D. S. S Casing
- Combination Casing Strings
- Upset Drill Pipe and Tubing
- Seamless Drill Pipe as well as Casing
- Electrogalvanized Couplings
- "Rotary Rolled" seamless pipe
- Round thread Drill Pipe, Casing & Tubing
- Internal Upset Casing
- Deoxidized Bessemer Steel Seamless Casing
- First drill collars from seamless pipe
- Warm Worked Casing
- Deep Well Casing
- Buttress Thread Casing

WELLS WITHOUT WELDS

NATIONAL TUBE DIVISION, UNITED STATES STEEL COMPANY, PITTSBURGH, PA.

UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS

UNITED STATES STEEL

put this WASTE-HEAT SAVER in your plant

Are you now cooling hot gas oil, cracking coil tar, hot gases or other hot fluids with water?

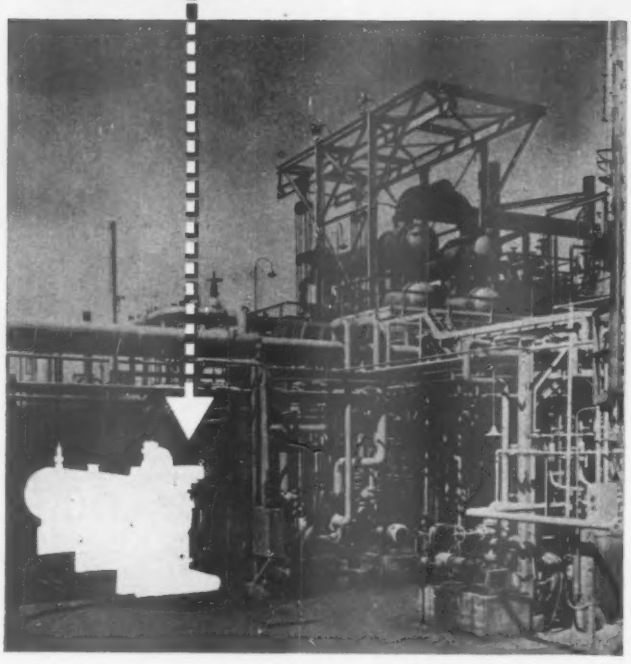
If so, investigate the G-R Waste Heat Steam Generator.

This unit uses waste heat to generate steam at boiler pressure from raw, untreated water. By doing so, it will reduce your process costs . . . your pumping costs . . . your cooling system load . . . and your boiler house steam demand.

The value of the steam produced by a G-R Steam Generator in the first year of service is usually sufficient to pay for the unit.

Various types are available to meet individual plant conditions and requirements, and special designs are available to reduce fouling of the tubes and scale accumulation.

Write for complete information on these heat-saving units that may effect important economies in your plant.



THE GRISCOM-RUSSELL CO., MASSILLON, OHIO

G-R Steam Generator

HEAT TRANSFER APPARATUS

GR 289

You Can Cut this High Cost Yourself!

*Eye Accidents Cost $176,000,000 a year in LOST MAN-HOURS alone**

If you have a defense contract (or even if you haven't) the shortage of skilled workers is probably one of your plant's most critical problems. Like many other companies perhaps you can obtain extra man-hours of production without adding a man or machine . . . if you PREVENT COSTLY EYE ACCIDENTS!

Your AO Safety Products Representative can show you how a safety goggle costing about $2.30 can prevent 98% of all eye injuries and pay for itself in *less than two hours* of a skilled *worker's time*. Or write American Optical Company, 411 Vision Park, Southbridge, Mass.

*Estimate. Industrial eye injuries cost over $5 per employed worker per year — with compensation averaging nearly $400 per injured man.

AO's Industrial Program increases production, decreases accidents. Write today for free booklet "Improved Industrial Vision."

American Optical
COMPANY
SAFETY PRODUCTS DIVISION

SOUTHBRIDGE, MASSACHUSETTS • BRANCHES IN PRINCIPAL CITIES

They Say—

Synthetics Plants Premature

"The early construction of commercial plants for making gasoline and other liquid fuels from coal or shale, as urged by Secretary Oscar Chapman, would be most premature . . .

"We must remember that no one can foresee which of the processes for making synthetic gasoline will ultimately prove most economic. A year ago Secretary Chapman wanted to spend approximately a half billion dollars on coal hydrogenation plants. Now the emphasis seems to be on shale, and Secretary Chapman also points out that a low-cost method of coal gasification might well lead to the Fischer-Tropsch process.

Since it will be much more than a decade before synthetic fuels from any of these routes can really compete with petroleum, the interim should obviously be spent on pilot-plant and other small-scale development work, aimed at improvement of the processes for converting both coal and shale.

"Large-scale plants would probably be obsolete before they were completed, and would cost many times as much as an intelligently planned research program which would give information of more real value."

Dr. R. E. Wilson, chairman of the board, Standard Oil Co. (Ind.), in a statement on Interior Secretary Oscar Chapman's proposal to build synthetic-fuel plants.

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Permian Basin
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TEXAS
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WITH
Welded LEASE TANKS
...no leaks...no seeps!
. . . and no unseen bottom seepage loss that might go unnoticed for years — or never be discovered. Thickness makes a big difference, too, in corrosive areas. Sivalls shop welded tanks are manufactured in all standard bolted tank sizes and in thicknesses up through 5/16 in plate. They're delivered to your lease, including the 1000 barrel size, shop tested, painted and ready for hook-up and use.
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TANKS, INC.
WRITE FOR ILLUSTRATED BULLETIN
SIVALLS TANKS, INC.

Move It, Please

Sir:

Being a regular reader of The Oil and Gas Journal, I have the honour to comment as follows:

The index page of your magazine often comes after unlimited number of pages from the beginning of the publication, and this often causes some inconvenience . . .

It is preferable if the index could be printed just following to the first cover . . .

Editorial page and subscription details are also preferred to come following or proceeding the index.

If such a matter could be regarded, the magazine will be easy to handle when referring to any particular article. One will have to look anything immediately he holds the magazine, as the index is known where to be found, instead of turning over and over, several pages whenever a reference is needed.

Mohamed Mohamed Hosni
Anglo-Egyptian Oilfields, Ltd.
Suez, Egypt.

Editor's note: Reader Hosni probably has the honor, also, of being the last to recommend the change. In response to many requests, the Journal began putting the Table of Contents on page 1 on June 9, shortly before Reader Hosni's letter left Suez.

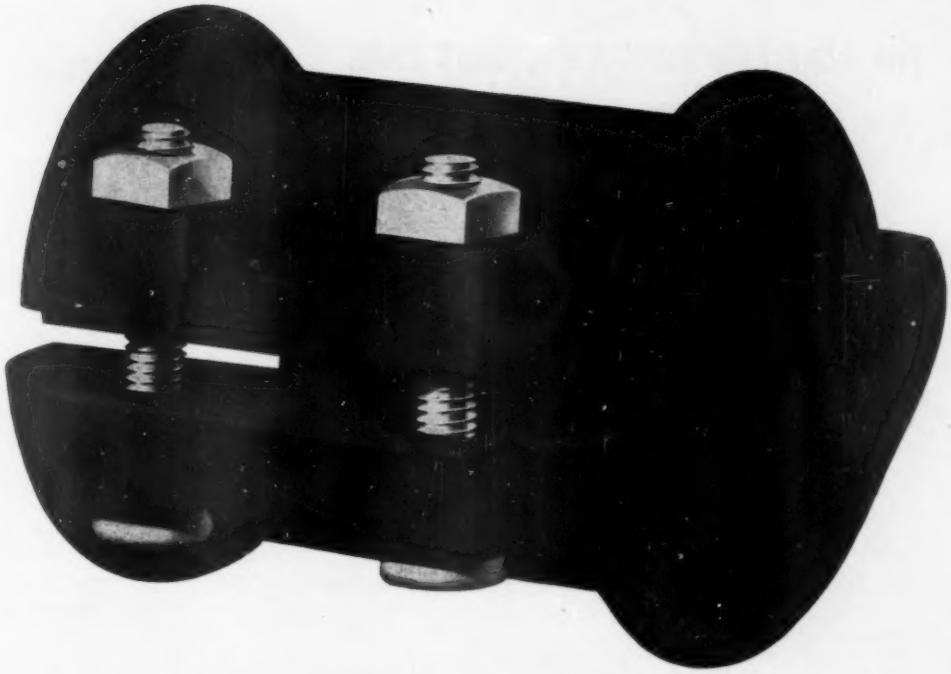
Clarification

Sir:

Reference is made to the material on the oil strike published on page 36 of your August 4 issue as an Oil Industry Information Committee release, Denver, Colo.

This material was not intended as an O.I.I.C. release but as a personal communication enclosing editorial material for your general information and such use as you might wish to make of it. I regret that this was not made clear in my letter of transmittal but would appreciate very much your clarifying this in your publication.

A. T. Smith
District Chairman
Oil Industry Information
Committee
Denver, Colo.



EMERGENCY PIPE CLAMP

SKINNER-SEAL

PIPE LINE CLAMP

During the present critical shortage of pipe, nothing compares with these clamps for repairing corrosion leaks and splits in services as well as mains—for all sizes of steel and cast iron pipe, ½" to 12". These clamps, constantly improved over the years, have been serving the industry for over half a century. In stock, all oil supply stores.

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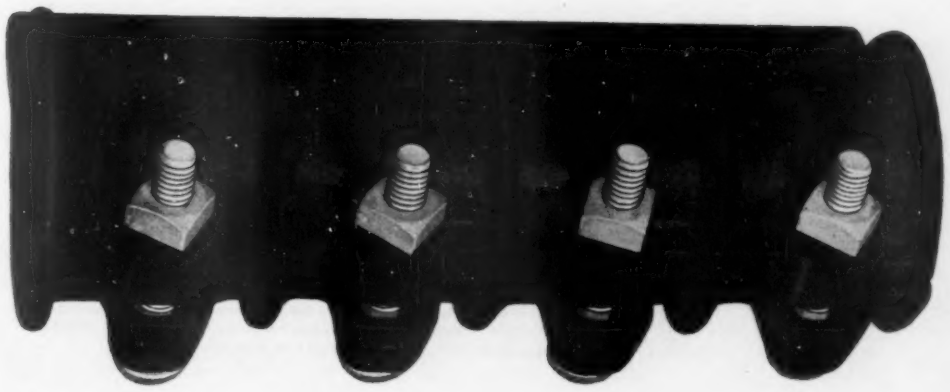
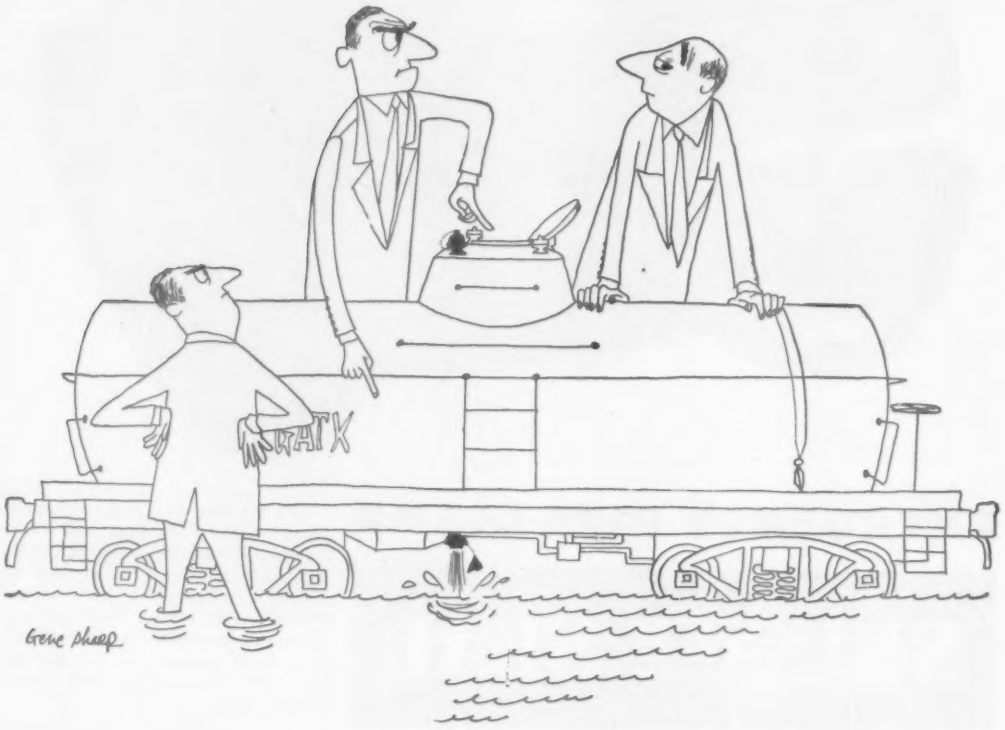


THE CARE AND NURSING OF TANK CARS



Always load a car with the outlet valve cap off so that if the valve is leaking, the leak will show up immediately.

Another way to get more from your GATX tank cars

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JOURNAL
TULSA, OKLAHOMA

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JOURNALLY Speaking

That Green Stuff

WITH commendable fortitude we have consistently resisted all impulses to write something about chlorophyll, that green stuff that is alleged to destroy all odors and is booming the sales of such diverse merchandise as toothpaste, garbage cans, dog food, inner soles, and pipe tobacco.

Since all the radio and cartoon gagsters are going to town with chlorophyll it has been suggested that we plug its use in gasoline to make filling stations irresistible to lady motorists, but our experience leads us to believe that the womenfolk would still let the family car run dry just before you want to use it.

Or that chlorophyll be used to sweeten up those West Texas sour crudes, or be sprayed on a refinery for the benefit of residents to leeward, or even to make that horrid Los Angeles smog unnoticeable.

But we refuse to admit that anything connected with the oil industry has a bad odor that needs to be masked with chlorophyll or otherwise. Besides, if we started making jokes about chlorophyll, somebody would be sure to write in and suggest that this page needs a good dose of the stuff.

Other Green Stuff

ANOTHER type of green stuff, not so spectacularly popular as chlorophyll, is getting some attention from science in the hope that it someday can be made useful to mankind. That's the algae that grows on pond water and the plankton that fills the sea. Maybe it can be turned into food and fuel.

There really is some connection between this green stuff and petroleum. These primordial forms of life are basically carbon and hydrogen, like the carbohydrates in food and the hydrocarbons in petroleum. So if we run out of food and oil all we have to do is scoop up a lot of this stuff, rearrange the molecules, and get synthetic gasoline, pork chops, lube oil, and rice pudding.

As a matter of fact, the oil industry owes its existence to plankton. Whales ate the plankton, men caught the whales, the whale blubber was made into illuminating oil, and oil lamps displaced candles. Then the demand got so great that Colonel Drake & Co. started the oil industry to cut in on this market.

But they didn't get away from plankton because, according to our admittedly primordial understanding of geology, petroleum was made out of plankton and similar sea scum which settled to the bottoms of oceans and got mixed up with sand and lime which were in the process of turning into rock and and then through the heat, pressure, and aging of Mother Nature had their carbon and hydrogen turned into petroleum hydrocarbons. So, in a manner of speaking, oil and gas are just fossil algae.

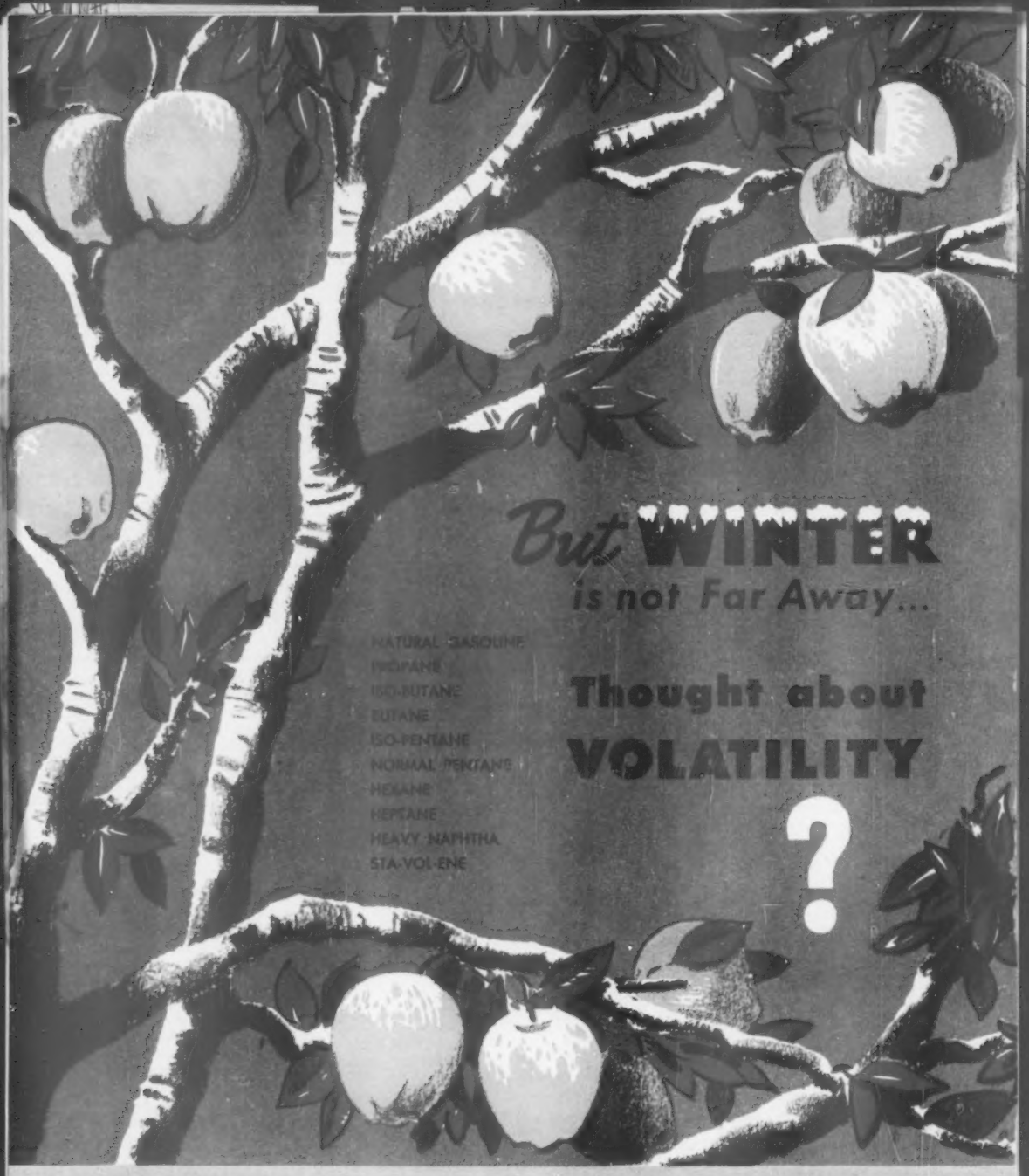
Now you can see the outlines of the plot: Instead of drilling for petrified plankton, just build a sieve across the Gulf Stream, strain out the live plankton, and run it through some catalytic crackers, reformers, polymerizers, hydrogenators, doctor sweeteners, homogenizers, and pasteurizers, and turn out cup grease, cup cakes, diesel oil, salad oil, petroleum jelly, or grape jelly, depending on how you set the dials.

This may sound a bit Buck Rogersish but it's a solemn fact that scientists are making serious studies of the commercial possibilities of plankton and algae. Nature seems perfectly willing to turn out a never-ending supply of this green stuff, so why not make use of it instead of letting it all go to feed the fishes? Maybe someday petrochemistry will give way to planktochemistry.

Greener Yet

THE conductor of this department is about as dried up as Oklahoma's pastures, so is lighting out to hunt for something green in the Canadian Rockies. Meanwhile this page will be turned over to green hands who, let's hope, will be able to come up with something as fresh as the first blades of spring.

—Henry D. Ralph



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The campaign is under way

THE Department of Justice investigation and the Federal Trade Commission report, involving seven international oil companies, are proof that the November campaign is under way with another smear for the oil industry as one of the starters.

More serious is the fact that if the administration persists in this obvious attempt to divert public attention from its own incompetence, including skulduggery in high places, a chain of events can be started which could quickly jeopardize everything that has been done by the western world to bring about sustained peace.

The current charges have a familiar ring, the main difference being that they are international in scope.

Price fixing, the squeezing out of competitors, production controls, and the like are alleged. Even the old reliable hocus pocus of foreign cartels has been trotted out and is being bandied about for domestic consumption.

AS the companies concerned have emphasized, there are no secrets as to how they operate. Furthermore, what has been done has been covered in previous investigations. Because of possible political repercussions, all major operating policies, before they were made effective, were checked in Washington.

It is true that the seven companies—five American, one British, and one Dutch-British—are guilty of bigness . . . and how fortunate for this country and the entire free world that this is true.

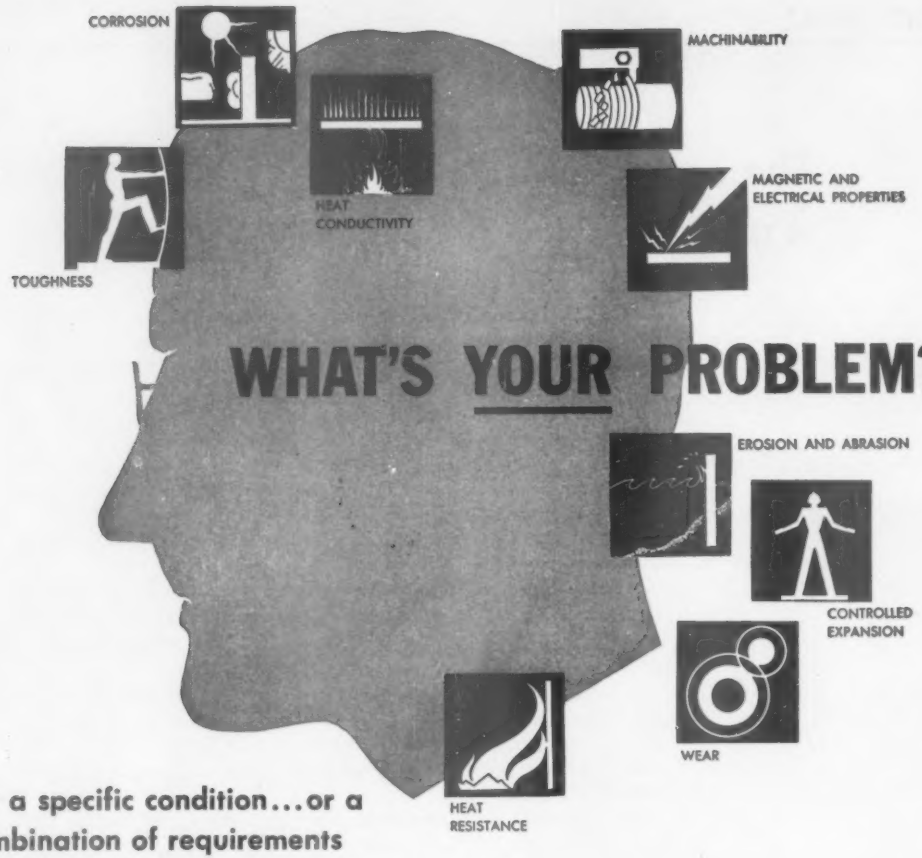
They largely fueled World War II, and since then they have accounted for the bulk of a 100 per cent increase in petroleum production outside this country and the Iron Curtain.

The great need of the western world in war rehabilitation has been oil; and had the seven companies not supplied most of it, the postwar recovery and military programs would never have materialized. Mammoth capital expenditures and great risks, which continue to this day, were involved.

LAST year, in one of the most remarkable expansions in industrial history, these companies were able to offset the loss of a 700,000 bbl. daily oil supply by Iran's nationalization. That loss might easily have brought the entire defense program, on which this country has spent billions, to its knees.

Thus, in making these ridiculous charges, the administration is playing into the hands of the enemy and inviting more Irans in scattered areas where the companies have developed proven oil reserves far greater than those of this country.

It is to be hoped that the managements concerned, for patriotic reasons as well as self-interest, will not take this latest affront lying down. This is a place for open hearings and not the closed doors of a grand jury directed by a discredited department of the Government.



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THIS WEEK

CARTEL. — Long-suppressed, much-talked-about Federal Trade Commission report charging a seven-company conspiracy to control the world's oil industry finally is released with Truman's consent. . . . FTC says virtual control of the petroleum industry made possible by joint ownership, interlocking directorates, crude-supply contracts. . . . Interstate Oil Compact and American Petroleum Institute accused of "serving as vehicles" for fostering international cartel. . . . Gulf Coast pricing of crude and products attacked. . . . Encouragement of conservation held suspect as a method of controlling supply, and therefore price, rather than strictly as a means of conserving a natural resource. . . . Charges not new, all having been studied in past by congressional committees. . . . No conclusions reached, no recommendations made in report. . . .

REFINING. — Shell Oil of Canada reveals plans to more than double capacity of its 7,000-bbl. refinery at Shellburn, a Vancouver, B. C., suburb. . . . The expansion, resulting from the construction of the Trans Mountain crude artery, will be completed at about the same time as the line. . . . ¶Standard of California will begin engineering work immediately for construction of a 54,000-bbl. vacuum-distillation unit and a 36,000-bbl. fluid catalytic cracking unit at its El Segundo refinery near Los Angeles. . . . ¶American Liberty lets contract to Fluor Corp. for large expansion of its Mount Pleasant, Tex., plant. . . . Filtrol plans ground-breaking for $5,000,000 waste-products chemical plant at Vernon, Calif. . . .

ANOTHER REFINERY-EXPANSION PROGRAM in the Vancouver area has been announced as a result of the approaching availability of crude oil through the Trans Mountain pipe line. Shell Oil Co. of Canada, Ltd., last week said it plans a $10,000,000 project to increase capacity of its North Burnaby refinery from 7,000 to 15,000 bbl. daily. This aerial view shows Shell refinery as it looks now. For details of Shell's plans, see Canada in the news section.

INTERNATIONAL.—World production nears all-time record as United States moves to make up output lost during oil strike and foreign countries set new all-time high. . . . New production marks established in June in Canada, Saudi Arabia, and West Germany. . . . Venezuela output off due to slump in heavy-fuel demand. . . . ¶British reported getting ready to suggest to Mossadegh that negotiations again be undertaken toward settling Iranian nationalization dispute. . . .

PIPE LINES.—Construction of a new products pipe line from Chicago to Detroit and Toledo will be undertaken by Shell, Texas, and Cities Service interests. . . . The project will be known as the "Wolverine" system. . . . ¶Sinclair Pipe Line pushes surveying and right-of-way work for the "Harbor Pipe Line," a new big-inch products carrier from the Philadelphia refining area to tidewater at Trembley Point, N. J. . . . Talks are now under way between Sinclair, Gulf Oil Corp., and The Texas Co. on a joint-participation plan. . . . The new line also would hook into the presently building Buckeye Pipe Line at Trembley Point. . . . ¶United States Pipe Line revamps plans to make much larger its projected big-inch products line from the Gulf Coast refining area to the East. . . . West Texas Gulf filling and testing 318 miles of huge West Texas-to-Houston area crude line. . . .

TRENDS.—With a new record in crude runs to stills at United States refineries (7,177,000 bbl. daily) for the week ended August 16, important changes appear to be under way in the statistical position of some products. . . . Stocks of distillates increased 5,245,000 bbl. last week following a gain of 3,907,000 bbl. the week previous. . . . With stocks of this product now 6,559,000 bbl. greater (7.4 per cent) than a year ago, the recent fears of short supplies this winter as a result of the refinery strikes of a few weeks ago now appear to be unwarranted. . . . Kerosine stocks increased 913,000 bbl. last week and residual fuel 657,000 bbl. with a decrease of 951,000 bbl. in gasoline inventories. . . . Gasoline markets continue strong. . . .

ACTIVITY.—Production of crude and lease condensate averaged 6,280,625 bbl. daily for week ended August 16, up 14,275 bbl. daily over previous week. . . . ¶Well completions dropped 133 from last week's peak of 997 to 864. . . . Wildcat completions were 206, down 43 from previous week. . . . ¶Active rotary rigs in the United States fell to 2,319 for week ended August 18, down 42 from previous week, to the lowest level since April 16, 1951. . . .

Oil Cartel Charges Published

THE long-suppressed Federal Trade Commission study of world oil operations, designed to prove the existence of an international cartel, has finally been made public.

Presented on this and the following pages are articles summarizing the much-talked-about report. They were prepared as a straight news summary of the contents of the 9-chapter government report, without comment, by Bertram F. Linz, the Journal's Washington editor.

Due to the timing of the release it was not possible to obtain comment from the companies concerned or other industry leaders on the charges.

The report reached no conclusions as to the effects of the alleged cartel, other than in generalities, and made no recommendations.

The study was initiated by the commission in 1949 and covers the activities of the five American and two foreign companies which allegedly are participants in the cartel. Material dealing with the Iranian situation which reportedly was included in the report as written in August 1951 did not appear in the version made public.

The seven companies which the commission charges control world oil are Standard Oil Co. (N.J.), Standard Oil Co. of California, Socony-Vacuum Oil Co., Inc., Gulf Oil Corp., The Texas Co., Anglo-Iranian Oil Co., Ltd., and the Royal Dutch-Shell Group.

None of the allegations in the report is new. They cover a range of activities which has been repeatedly investigated by congressional committees—the partnerships between the companies in various ventures, their dominance in the fields of reserves, production, refining, transportation, and marketing, and the interlocking directorates which, in effect, the commission charged, put control of the world oil business in the hands of a few men.

Background . . . The furor over an international oil cartel had its genesis some five years ago, when Norway submitted a resolution to the United Nations Social and Economic Council calling for creation of an international oil authority to administer the world's oil resources.

The resolution followed a report by a Swedish government commission charging that a cartel had existed as early as 1928. The purpose of the U. N. agency would be to amend the concessions held by oil companies in the Middle East. By a vote of 8 to 2, with eight countries abstaining, the resolution was rejected.

In the spring of 1951, Elmer Patman, Austin, Tex., oil attorney and nephew of Rep. Wright Patman, chairman of the House small-business committee, attended the World Petroleum Congress at The Hague and last December submitted a lengthy report in which he charged that a group of international companies were attempting to take over the world oil business on a basis of Middle East production *(The Oil and Gas Journal, January 7, page 48).*

In the intervening 5 years several congressional committees have investigated the oil situation with a view to writing a national oil policy, but in no instance have they come up with any charges or even intimations of the existence of a cartel.

Method of Control

Seven firms own 65 per cent of world's reserves, control 57 per cent of refining, half of all tankers, FTC says

WASHINGTON.—The dominant position of five American and two foreign oil companies is "the outstanding characteristic of the world's petroleum industry," it was declared this week by the Federal Trade Commission.

The method in which this group achieved its present position in the international oil industry was traced from the turn of the century in the hitherto suppressed report made public through the efforts of Sen. John Sparkman of Alabama, chairman of the Senate small-business committee and Democratic candidate for vice president.

Extent of control . . . "Apart from Mexico and Russian-controlled countries, these seven companies control directly or indirectly most of the world's petroleum business," the report charged.

"Control of the industry by these seven companies extends from reserves through production, transportation, refining and marketing. All seven engage in every stage of operations, from exploration to marketing.

"The typical movement of petroleum from producer until acquired by the final consumer is through intercompany transfer within a corporate family. Outright sales, arms-length bargaining, and other practices characteristic of independent buyers and sellers are conspicuous by their absence.

"Control is held not only through direct corporate holdings, by parents, subsidiaries and affiliates of the seven, but also through such indirect means as interlocking directorates, joint ownership of affiliates, intercompany crude purchase contracts, and marketing agreements," the FTC report said.

It showed that in 1949 the seven international companies owned about 82 per cent of all foreign crude reserves and about 34 per cent of the United States reserves, or 65 per cent of the world's estimated crude oil reserves. Outside the United States, Mexico, and Russia the group controlled about 92 per cent of the estimated reserves.

Production . . . With this concentrated control over reserves, the report said, it follows that the group also should be dominant in production.

In 1949 it accounted for more than one-half the world's crude output other than in Russia and its satellite countries, and if its share of United States production is excluded it accounted for 88 per cent of the remaining world production.

"This figure understates the degree of control of the private petroleum industry," the commission pointed out, "because some of the output outside of the United States and Russia is produced by countries with state monopolies. Since the production of these countries must first satisfy internal demands, it is evident that only a relatively small quantity of crude is available from any source other than one of the seven large companies."

Refining . . . The control of the seven companies extends to refining, the report said. In 1950 they controlled almost 57 per cent of the world capacity and more than 77 per cent of the capacity outside the United States and Russia, the report continued.

Control of the world's cracking capacity is even more concentrated, and this fact, the commission asserted, is potentially of greater economic significance than control over crude-refining capacity. In 1950 the group owned 85 per cent of all cracking capacity outside the United States and the USSR.

Tankers . . . In transportation, the seven companies own or control about two-thirds of the total privately owned tanker fleet, which is equivalent to about one-half of the world's total tanker tonnage. They also own all of the important pipe lines outside the United States.

Marketing . . . Continuing to trace the flow of oil, the commission said that perhaps in no other raw material industry is the control over marketing so highly concentrated as in petroleum.

"While a detailed analysis cannot be given, due to the scarcity of statistical data," the commission said, "it would appear that the seven international oil companies are dominant forces in nearly all foreign markets.

"In any event, it does not appear necessary to develop any elaborate statistical agreement to support the conclusion that the seven international oil companies have a highly concentrated control over marketing.

"Such control would seem to be inevitable for the simple reason that there are no other companies operating in international markets capable of supplying petroleum products in substantial quantities.

"Upon the secure basis of their control over production, refining, and transportation, the seven international oil companies have built extensive marketing organizations reaching into consuming areas in all parts of the world. The power of these major companies is so substantial as to be virtually unchallengable, except, perhaps in particular local marketing areas."

Company ties. . . . The report outlined the "clusters" of corporate interrelations of the seven companies.

. . . In the Middle East, it said, Jersey Standard, Socony, Royal Dutch-Shell and Anglo-Iranian "are linked through their joint holdings in Iraq Petroleum Co. and its nest of subsidiaries"; Gulf and Anglo-Iranian jointly own Kuwait Oil; Standard of California and The Texas Co. have many joint relations through the California-Texas complex of companies and are tied to Jersey Standard and Socony through Arabian American Oil Co. and Trans-Arabian Pipe Line Co.

. . . In Eupore there is the California-Texas cluster of companies linking Standard of California, and Texas Co.; Anglo-Iranian, Royal Dutch-Shell, Socony and Jersey Standard jointly own Companhia Africana de Petroleo; while Gulf and Jersey Standard are tied through their holdings in United Petroleum Securities Corp.

. . . In Latin America. A major complex of holdings links Socony, Standard of California, and Texas, while another brings together Jersey Standard, Gulf and Royal Dutch-Shell, it said.

. . . In the Far East, the report said, the most important single complex is the combination of Jersey Standard, Socony, Texas, Standard of California and Royal Dutch-Shell through N. V. Nederlandsche Nieyw Guinee Petroleum Mij. The California-Texas combine also operates in the Far East, as does Standard-Vacuum, and Anglo-Iranian and Royal Dutch-Shell jointly conduct extensive operations in the Far East as well as Europe.

The report pointed out that the principal international companies also conduct many joint operations in the United States and Canada and have established a corporate network of joint holdings with major domestic oil companies.

Significance of ties . . . "These intercorporate relations are important in that they expand the area of potential control that may be exercised by the seven international oil companies," it commented.

"But also important is the type of company through which the joint-ownership relations are effected. The fact that pipe-line companies and companies concerned with patents and technological processes are common among the jointly owned companies is not without significance. Technology and transportation are strategic points in the oil industry for exerting the maximum of control."

The boards of directors that manage the "labyrinth of foreign corporations" which are jointly owned by the group provide organizational opportunities for joint action and the establishment of a common oil policy throughout the world, the commission alleged.

While not all interlocking directorates are significant and some may be fortuitous, it said, "nonetheless the fact that they exist on such a widespread scale in the petroleum industry makes it possible for a small group of individuals to exercise unusual influence on the industry's operations and behavior."

Summing up this phase of its study, the commission commented:

"The significance of this high degree of concentration for the cartel problem lies in the fact that concentration facilitates the development and observance of international agreements regarding price and production policies. Indeed, the concentration of an industry into a few hands may be regarded as the *sine qua non* of effective cartel operations."

How Cartel Works

Crude-supply contracts, together with joint ownership, provide workable basis for world control, FTC declares

WASHINGTON. — Crude-oil supply contracts and production and marketing agreements are the basis on which "the big seven" international oil companies control the world oil movement, it is charged by the Federal Trade Commission.

The use of crude-oil supply contracts to control the production of oil had effectively bound together the major oil interests in Venezuela a decade before the Middle East was developed, but was applied in the latter area with the same results, the commission asserted.

In Venezuela, however, such contracts were on a far more comprehensive nature, welding the interests of the parties together in an explicit joint enterprise lasting for the life of the concessions owned by the joint enterprise.

Middle East Contracts

In addition to joint ownerships, the supply contracts have provided another basis for joint control over oil production and marketing, the report said, and in the Middle East they result in a sharing of production in Kuwait and Iran and a channeling of the oil to the market "in the hands of firms able and interested in maintaining world prices and markets."

"These two instruments of control utilized in the Middle East—joint ownership and crude-oil supply contracts—have, in effect, served to complement each other in protecting the mutual interests of the international oil companies in the production and marketing of world oil," it added.

How they worked . . . Under its 1933 joint ownership agreement with Anglo-Iranian, the commission explained, Gulf was bound not to disturb Anglo-Iranian's marketing position at any time or place.

A restriction which had particularly restrained Gulf from entering markets "east of Suez." The terms and nature of a Gulf-Shell contract of 1947, however, imposed new restrictions on Gulf; thus if Gulf should use Kuwait oil to increase its business in any Eastern

Hemisphere market at the expense of Shell, it would be penalized by an equivalent reduction of its deliveries to Shell.

Similarly, Gulf would share, under the profit-sharing principle in the losses occasioned by any price cutting in any Eastern Hemisphere market.

"Such price cutting would be expected to result if Gulf, in the utilization of Kuwait or any other oil, tried to invade any new markets or to increase its share of business in any established market," the commission pointed out.

Similarly, the report said, the areas in which Jersey Standard and Socony could dispose of the large quantities of oil acquired from Anglo-Iranian were also specified in the contracts. Not more than 5 per cent of this oil could be distributed east of Suez, a provision penalizing any excess shipments to this area being asserted in supplementary agreements to go into effect January 1, 1952.

Effect of contracts . . . "Thus the crude-oil supply contracts, not only because of the large quantities of oil and the long periods of time that were specified, but also because of the unusual provisions as to price and marketing, constitute effective instruments for the control of Middle East oil," the commission alleged.

"As such, they complement and increase the degree of joint control over Middle East oil resulting from the pattern of joint ownership . . . The operation of these two instruments of control, in effect, brings the seven international oil companies, controlling practically all of the Middle East resources, together into a mutual community of interest."

Venezuelan Contracts

In Venezuela, the supply contracts brought together Gulf, Standard of New Jersey and Shell, which jointly owned Mene Grande Oil Co., originally a 100 per cent Gulf subsidiary.

These agreements were made before the war at a time when the world oil industry was greatly concerned with the problem of "overcapacity."

Reasons for agreements . . . "The interests of Standard and Shell lay in 'stabilizing' and controlling Venezuelan production in relation to markets for petroleum and petroleum products elsewhere in the world," it was explained.

"The various agreements facilitated the achievement of this goal, and the exchange of money and rights to oil was the instrument for fixing the interests of the parties.

"For cash, Gulf surrendered its management prerogatives and accepted a position as a junior partner in the Venezuelan industry. Standard (N. J.) and Shell consolidated their control over the Venezuelan petroleum industry.

"Production quotas were fixed for about 70 per cent of Venezuelan capacity. Shell alone remained outside of the quota arrangement but had knowledge of and consented to it.

"Joint" enterprise . . . "These contracts for the sale of oil, therefore, had unusual features that distinguish them from ordinary business transactions.

"The three parties to the contracts became in reality partners in a joint enterprise, each holding undivided interests in the assets of the joint enterprise. The 'price' paid by Jersey Standard and Shell for the oil they received was the cost of production of that oil.

"The 'profit' accruing to Gulf from the 'sale' of oil was the fixed sum initially paid, i.e., $100,000,000, less one-half of the book value of Meneg's assets in 1937, irrespective of the quantities of oil that would actually be delivered over the life of Meneg's concessions and interests in Venezuela.

"The 'sale of oil' features of these contracts thus appear as a sharing of oil among the three companies while the contracts themselves appear to have been designed to further the regulation and control of the development of crude-oil production in Venezuela."

Marketing agreement . . . The next step in the pattern of control, the commission said, was the production and marketing agreements resulting from a feeling in the middle 1920's that greater control in distribution markets was needed.

"At that time," the commission explained, "it became evident that the existing degree of control over production constituted an inadequate basis for controlling price competition, even among the largest companies; for a price war broke out in Asia between two of the large international interests, and thereafter, in 1928, an international cartel agreement was formed among the principal international companies."

Purpose of that cartel, the commission charged, was to forestall market competition, both among the participants and with others, through control of production and exports.

"It was followed by other agreements designed, first, to forestall competition more fully among the parties to the main agreement and, second, to extend the international's group's control over the activities of independents through separate local marketing agreements formulated so far as possible in accord with the principles and procedures agreed upon by the parties to the main agreement. These agreements covered the period from 1928 to the outbreak of World War II. They were an integral part of the pattern of concentrated big-company control over world oil resources and trade."

Gulf-plus pricing . . . The pricing method adopted, the commission said, was designed both to reserve to the cartel members all cost savings resulting from the exchange of oil supplies and to give effect to a principle of the Achnacarry agreement "that the value of basis products of uniform specifications are the same at all points of origin or shipment."

"Under Gulf-plus, prices in world markets were fixed at the level of prices at the United States Gulf plus standard freight charges from the United States Gulf to consuming markets.

"During the 10 years from 1919 to 1928, however, increased production of crude oil, especially in the United States, Venezuela, Russia, Romania, Iran, and Netherlands East Indies changed the condition of the petroleum market from one of anticipated shortage to what the preamble to the Achnacarry agreement described as tremendous overproduction."

"The continued use of the Gulf-plus pricing system under these changed conditions afforded an unusual opportunity to the framers of the Achnacarry agreement," the report said.

How Prices Were Set

FTC says old Gulf-plus system worked to advantage of big international firms and does now even with modifications

WASHINGTON.—Use by the international oil companies of the Gulf-plus basing-point system for pricing crude oil and products eliminated differences in delivered prices among the sellers at any destination.

It also made the relatively high U. S. Gulf prices the basis for both crude and product prices throughout the world.

In a discussion of oil pricing in its lengthy report on international cartels, the Federal Trade Commission outlined the situation that developed during the war.

Then, it said, the Persian Gulf was made a basing point with prices equal to those prevailing at U. S. Gulf ports at the insistence of the British Government, which objected "to the large amounts of phantom freight" involved in buying bunker fuel on the basis of Gulf-plus.

Dual system . . . Under the dual bas-

M. A. Wright

ing point system thus set up, the point of equalization where Persian Gulf products and U. S. Gulf products were delivered at equal prices was the mid-Mediterranean, and shipments from either producing area beyond that point required the absorption of freight.

The postwar reopening of western European markets which had been closed to Middle East producers during the war made this absorption of freight important, especially to Middle East producers, the commission said.

Between November 1946, when OPA price controls were terminated, and April 1948, U. S. Gulf prices moved sharply upward, but advances in the Persian Gulf base price for crude lagged behind the advances in U. S. Gulf prices, finally stabilizing about the end of 1947 at $2.22 per bbl.

"This price, although lower, was tied to the United States Gulf price by a definite pricing formula under which the price of crude originating in both areas was equalized at the United Kingdom, thereby opening a wider market for Persian Gulf oil without absorbing freight under the basing point formula," the commission explained.

Pricing formula . . . "The formula consisted of adding to the quoted base price for Venezuelan crude the USMC freight rate to the United Kingdom, and deducting therefrom the USMC freight from the Persian Gulf. This yielded the base price for crude at the Persian Gulf.

"Thereafter, this formula, sometimes using USMC rates and sometimes using lower freight charges when open-market charter rates fell below USMC rates, was systematically used to link the Persian Gulf base price for crude to the higher base price prevailing at United States Gulf ports.

"This same formula was used in July 1949 when, in recognition of the fact that Persian Gulf crude was moving to the United States in quantity, the point of equalization was moved to New York."

ECA ordered change . . . When ECA began financing shipments of refined products it found that the use of straight basing-point pricing resulted in price discrimination as between countries to which it financed shipments.

To correct this it divided the European market into zones and ruled that the price it would pay for Persian Gulf products delivered in a given zone would be no more than the realized netback for Persian Gulf products computed by deducting the USMC rate from the Persian Gulf to the zone from the alternative delivered price for Western Hemisphere oil to that zone.

The industry objected strenuously to this reduction, the commission commented.

"Throughout the period under review, the major international oil companies have clung tenaciously to the basing-point method of pricing," the commission alleged.

Regardless of the fact that they modified the single-basing-point system and made other concessions largely as the result of government pressures, the existing price structure is still highly profitable to the small number of major international oil companies that dominate world production.

Compact, A.P.I. Accused

FTC says both organizations helped foster international oil control; ulterior motive seen in conservation work

WASHINGTON.—The Interstate Oil Compact Commission and the Webb-Pomerene Export Trade Act have been used as vehicles for the development of control of the world oil industry, it is charged by the Federal Trade Commission.

An effort to expand the American conservation pattern into a world-wide movement, the commission alleged, was spearheaded in 1928 by the American Petroleum Institute, which called a conference of representatives of the larger producing companies for informal discussions.

In March, 1929, the first control plan of the A.P.I.'s committee on world production and consumption of petroleum and its products was presented at a meeting in Houston, attended by both federal and state government, as well as industry, representatives.

Anticipating that questions would arise as to its authority to approve such a proposal, the Federal Oil Conservation Board asked the Attorney General for legal advice, and was informed that Congress had not given the board any power to grant immunity to any person from the antitrust laws. On the basis of that advice, when the plan was submitted to it, the board notified the Institute that it had no legal authority to regulate drilling and production and that the sole authority for such action rested with the states.

Conservation only . . . The result of these efforts was the domestic proration controls and Interstate Oil Compact, which have frequently been charged before congressional committees to be as much price-sustaining as conservation measures, a viewpoint with which the FTC apparently agrees:

"While the prevention of waste in the use of oil as an exhaustible natural resource is a desirable economic objective, the facts surrounding the initiation of the conservation movement in the United States and the history of its subsequent operation are such as to strongly indicate that the prevention of waste is not the only motive behind the support of the movement by international oil interests.

"Conservation was urged by the Industry, not at the time when it feared the imminent exhaustion of domestic reserves, but during a subsequent period when the discovery of new fields had created an embarrassing surplus in the United States.

"Moreover, the detailed features of the proposed conservation plan and the subsequent restrictive effects of proration fitted admirably into the world-wide 'as is' agreement of the 1930's by limiting United States flush production and thereby tending to enhance and maintain published Gulf prices, which were the base prices or values used in determining world prices.

"It is true that the geographical location of flush production has shifted with the United States becoming an importing nation. Yet in the thinking of the industry, proration still is the means of balancing supply with demand in the United States in such a way as to maintain prices.

Export agreements . . . In addition to launching the conservation movement, the American oil companies also sought to implement their alleged cartel agreement through the formation of two export trade organizations under the Export Trade Act, Standard Oil Export Corp. and Export Petroleum Association.

Under the act, companies could operate jointly in the export field without being subject to our antitrust laws.

The Export Petroleum Association, composed of a number of companies, found that control of exports was difficult without the cooperation of independent producers, refiners, and exporters but was unable to secure the necessary cooperation and the organization became inactive and eventually was dissolved.

"The reason most frequently assigned for the collapse of the Export Petroleum Association was the inability of the American interests to agree on

prices through unanimous action by the price committee," the commission commented.

While these efforts to establish worldwide controls were not completely successful, the report continued, they laid the groundwork for direct control of production in particular flush fields, and marketing agreements and understandings in particular marketing areas. An example was the "memorandum for European markets" in 1930, the so-called "as is" agreement in which quotas were to be allotted for each of the products classed as part of the internal trade of each country.

"As is" principles . . . The principles of the "as is" agreement were:

1. Acceptance by the participants of their present (1928) volume of business and their proportion of any future increase in consumption.
2. Joint use of existing facilities.
3. Construction of only such additional facilities as were necessary to supply increased demand.
4. Production to retain the advantage of geographical location on the basis that "values of products of uniform specifications are the same at all points of origin."
5. Supplies to be drawn from the nearest producing area.
6. Excess of production over consumption to be shut in by producers in each producing area.
7. Elimination of any competitive measures or expenditures which would materially increase costs and prices.

"These principles were never formally abandoned," said the commission.

Subpoena Headache

Some say it would take years to dig out all data demanded by the Government; jurisdiction questioned in some cases

Dahl Duff

NEW YORK.—A dozen oil companies here are literally turning themselves inside out in an obviously futile effort to obey a federal grand-jury subpoena.

Thousands of man-hours are going into the task of searching out 24 years of detailed records which a U. S. District Court in Washington has ordered before it September 3 when the Department of Justice launches its investigation into charges of an international oil cartel.

Regardless of whatever else it finds out, the Government is certain to learn that it has no monopoly on paperwork. Estimates of how long it would take to run down all the documents the Government is demanding range up to several years.

In one of the largest companies involved, each department has designated an official to take charge of the search. File after file of records is being examined to determine if it falls within the scope of the subpoena. The cost of photostating alone is a substantial item. Some records are on microfilm.

What was demanded . . . The subpoena naming the classes of records required by the Government was served on the companies August 6. Thus there was less than a month to sift through records accumulated over nearly a quarter of a century. Some believe the Government never expected that the companies would be able to comply.

The subpoenas commanded the companies to produce all agreements and contracts relating to concessions outside the United States, crude-oil purchases and exchanges, deals on products, or involving ownership of patents or producing, refining, or transportation operations.

The companies also were ordered to turn over all letters and other communications relating to international oil prices, contract interpretations, or oil sales to any United States Government agency for delivery outside the United States. The period covered was January 1, 1928, to July 15, 1952.

Several of the companies are understood to have requested they be granted additional time in view of the broad terms of the subpoena and the enormity of the task it required.

For some it's easy . . . Nothing officially and very little unofficially is being said by the companies as to the progress being made in complying with the subpoena. For a few—for example, Conorado Petroleum Corp.—the subpoena will be easy. Conorado has been in existence only about 4 years and has no active operations.

But for most of the companies, including important members of the industry such as Standard Oil Co. (N. J.) Socony-Vacuum Oil Co., Inc., and Gulf Oil Corp. obeying the subpoena is a major undertaking.

The investigation is raising some rather interesting questions of jurisdiction. One of these is the position of the several wholly foreign owned companies which were ordered to appear with their records. These are Anglo-Iranian Oil Co., Ltd., Royal Dutch Petroleum Co., Ltd., and Shell Transport & Trading Co., Ltd. Anglo-Iranian has no oil operations whatever within the United States.

Another question concerns foreign affiliates which may be headquartered outside the United States and keep their records in that locality. Some of these companies are majority owned by American parents; in any case they would seem to be more under control of a foreign government than a grand jury in Washington.

Charges Criticized

Jersey Standard played no part in any illegal setup

NEW YORK.—F. W. Abrams, board chairman of Standard Oil Co. (N. J.), last week joined other industry leaders in their criticism of the Federal Trade Commission cartel charges, since made public.

"I want to repeat categorically," Abrams said, "that Standard Oil Co. (N. J.) is not a party to any international oil cartel and, in fact, doubts that such a cartel exists, nor is it a party to any illegal arrangements of any kind anywhere in the world."

Jersey Standard's arrangements in the Middle East, Abrams said, "have been undertaken openly and with the knowledge and encouragement of every administration, including the present one, for the last three decades.

"These investments have not only been of great value to the defense and prestige of our country, but have been a major factor in economic advancement of nations whose friendship and support our country has actively sought," he declared.

When the report is distributed, Abrams said, "we shall have substance to deal with instead of the rumor and innuendo which apparently have deliberately been associated with the preparation and suppression of this so-called 'secret' report."

Jersey Standard, he added, "has never had the opportunity to see the report or to comment in any way on its contents, either during its preparation or during its apparent widespread circulation in Washington circles."

Reports from people who reputedly have seen it, he said, indicates that there is little more than "arbitrary interpretations aimed at distorting actions and circumstances which have, in fact, an entirely different and proper significance," Abrams added.

Spraberry Dilemma

Wider spacing or new recovery method needed to make most wells profitable; imbibition looks good, but difficult

MIDLAND, Tex.—Drilling contractors, petroleum engineers, and the oil producing companies themselves right now are virtually at a dilemma in their concern with the enigmatic Spraberry trend area.

The huge 7,000-ft. deep field on the east side of the Midland basin platform has 1,000,000-plus productive acres but the oil recovery indicated for a considerable part of it will not pay out the cost of the necessary drilling and producing operations.

This is the growing opinion of more and more Spraberry operators, at least for 40-acre spacing. Engineering studies are now well established which indicate much of the ultimate recovery will run only some 600 bbl. per acre, or about 24,000 bbl. total per well on 40-acre well spacing.

Such recovery would leave a deficit of $34,350 or more per 40-acre well, before lifting costs, interest, and taxes. There are, however, a number of Spraberry areas and reservoir sectors which will have considerably better ultimate recoveries.

Two possibilities . . . There are two approaches as to what might be done in improving Spraberry profitability and well payouts. One is short-term and the other long-term.

On the short-term basis, one thing that can be done immediately for the remaining proven but undrilled areas, and which gradually has won wide advocacy, is to space the wells wider, preferably one well per 80 acres.

The long-term hope for betterment is the development and application of some kind of improved oil-recovery process. This would apply both to tnat already drilled, and that to be drilled. One possibility in such direction is the recent application of Atlantic Refining Co. to the Texas Railroad Commission for field experimental test of "water imbibition displacement" in the Driver area of southwestern Glasscock County *(The Oil and Gas Journal, August 11, page 72, and August 18, page 157).*

Basic difference between water flooding and water imbibition displacement, according to Atlantic engineers, is that in water drive the oil is displaced by a piston-like push; in imbibition, movement of the water is generated by capillary attraction and the oil is coincidentally moved and displaced. The water entry or imbibition can be independent of any substantial externally applied pressure.

However, engineers almost universally have had objections to the straightforward type of water flooding in the Spraberry due to the fractured nature of the formation, which would permit a water drive to channel very rapidly. On the other hand, in the water-imbibition method, with its capillary displacement of oil, the research personnel of Atlantic say the fractures will make a convenient starting point for the water to be imbibed or sucked into the minute interstices of the matrix rock, and displacing the oil therein.

Unitization problem . . . Even in the event that water imbibition could successfully function for the conditions of pressure, porosity, permeability, and fractures present in the Spraberry, and assuming that there would be sufficient time for proper capillary displacement of the oil, there still are some other considerations, or objections. What about a water supply?

"Let us suppose that Atlantic's experiment does prove successful," some operators say. "What then? Secondary recovery in the Spraberry is not feasible unless the trend, or at least its most productive 500,000 acres, is unitized. The job of unitizing this vast area, with its 20,000 or more royalty owners, would tower above the Scurry unitization project like the walls of the Grand Canyon tower above the Colorado. It might take years to work out a formula satisfactory to 65 or more per cent of the royalty owners.

What about water . . . "And once we have unitization," those operators say, "where in drouthstricken West Texas are we to find enough water? Remember, it is known that there are at least 500,000, possibly 1,000,000 productive Spraberry acres.

"The Spraberry has an average thickness of 1,000 ft. It has two pay sections, the upper and lower Spraberry sandstone, each section having a thickness of approximately 300 ft. The lower Spraberry is not generally productive north of the Driver-Spraberry field of southeastern Midland County and southwestern Glasscock County, but upper Spraberry pay is found as far north as Dawson and Martin counties, with both the upper and lower Spraberry generally productive in southeastern Midland, southwestern Glasscock, northeastern Upton and northwestern Reagan counties. That amount of sandstone would imbibe a 'whale of a lot' of water."

These "I-want-to-be-shown" operators, however, admit that Atlantic will have made an extremely valuable contribution to the science of secondary recovery if its water-imbibition displacement method proves successful, even on a limited scale.

"Even though the method is found to be a complete success, however," they say, "it will be a long time before its use will benefit trend operators through increased recovery of oil in place and ours is an immediate need."

Dollars to pay out . . . The immediate need is illustrated by money figures submitted by one operator: he has spent more than six million dollars in the trend in three years. His wells have recovered only one million dollars worth of oil. "We will feel fortunate," he said, "if we realize another one and one-half million dollars from our properties under present 40-acre spacing regulations."

Up to August 1, 1952, in the Spraberry trend there were 1,936 producing wells and these had put into the tanks 29.6 million barrels of oil. At an average of $90,000 per well, cost of these 1,936 wells has been $174,240,000. The seven-eighths net value of the oil recovered at $2.65 per bbl. has totaled $68,635,000. In other words, the financial status quo at this time is that $105,605,000 more oil must be forthcoming, after all operating expenses, taxes, and other out-of-pocket cash charges are paid, before the remaining present development investment is returned.

Caution is the word . . . Although many operators are suffering financial headaches as a result of the belated discovery that the 40-acre spacing pattern for certain sections of the Spraberry trend will not pay out, this should not be construed to mean that the Spraberry will become for the future, a graveyard of abandoned locations, proven but undrilled.

Contrariwise, development is being continued. There is this difference: individual operators are proceeding with far greater caution as they move toward a decision to spend $90,000 in the drilling of a Spraberry well. They want to study its location, and deter-

mine how many acres this location can drain from other locations. *(For detailed Spraberry area well communications, drainage, and interference data, see the Journal, August 11 issue, page 73).*

Spacing policies . . . Generally, most operators in the Spraberry are continuing operations on these conditions:

1. Offset obligations are met and inside locations are drilled to protect against drainage.
2. Forty-acre spacing is followed only when the operator is forced by offset operation.
3. A standing agreement has been made between several operators to avoid staking locations which will force their neighbors to drill on the 40-acre pattern.

These producers are satisfied that well-to-well communication exists with the 80-acre pattern in operation. As one example, one producer reported that a lease being drilled on the 80-acre program reflected a reservoir pressure of 2,300 psi. a year ago. Continued drilling revealed the fact that recently opened wells recorded a bottom-hole pressure of 1,800 psi., a pressure comparable to those recorded in the older wells.

A case for 80-acre spacing also is reflected by bottom-hole pressure data collected from a widespread area. It has been found that in some areas where the 80-acre spacing program is being used, the minimum bottom-hole pressure decline is at a rate of 0.59 psi. per day. In contrast, the area developed and producing in the 40-acre spacing pattern has shown a decline as high as 3.86 psi. per day.

Record Allowable Set

Railroad Commission fixes Texas' September production at 3,225,415 bbl. daily, allows 22 producing days for month

AUSTIN.—A new all-time record high in production allowable was ordered by the Texas Railroad Commission for September at its monthly meeting last week. For the fourth time in the state's history a production of more than 3,000,000 bbl. daily will be allowed.

The increase of 261,201 bbl. daily over current production is to be accomplished by raising the producing days for the state generally to 22 days as compared to 20 days for August. This will make the allowed production 3,225,415 bbl. daily, which is significantly greater than the record set in October 1951 of 3,115,512 bbl. daily. East Texas will still be on 19 producing days.

While there was almost universal sentiment favoring higher production next month, the increase granted by the commission was several hundred thousand barrels daily greater than nominations of 3,052,618 bbl. daily which purchasers had announced prior to the hearing.

Evidently three factors were responsible:

. . . There has been a significant drop in above-ground crude-oil stocks. For example, U. S. Bureau of Mines figures indicate a decline of more than 11,000,000 bbl. in the 6-week period ending August 9.

. . . Petroleum Administration for Defense has been urging refineries to operate their expanding facilities at full capacity in order to meet winter demands for heating oil. Refineries on the Gulf Coast are short of crude, and hence the need for increased production.

. . . Crude oil imports are continuing to rise, as indicated by the testimony of one industry representative before the commission. It was asserted that daily imports of foreign crude increased more than 100,000 bbl. daily up to a new high of 616,000 bbl. during the period of curtailed production in Texas which followed the refinery strike. Domestic producers in Texas, and especially the independents, are not inclined to see this trend continued.

All in all, most of the purchasing companies favored 22 producing days for September. Exceptions were voiced by Stanolind Oil & Gas Co., which advocated an even further reduction in above-ground stocks, and by Atlantic Refining Co., which felt that 22 days would cause excessive production of West Texas sour crude.

Following is the complete tabulation of allowed production by Railroad Commission districts for September.

ALLOWABLE BY DISTRICTS

District—	Bbl. daily
1	40,035
2	175,205
3	512,675
4	282,354
5	53,613
6 Outside East Texas	131,546
East Texas field	274,298
7B	128,397
7C	193,450
8	1,090,308
9	247,294
10	96,240
Total	3,225,415

WEST COAST

Tidelands Action Planned

LONG BEACH.—Plans for a meeting of officials of states which have lost control of their tidelands were discussed by California and Texas officials in a recent preliminary meeting here.

It is expected that California, Texas, Mississippi, Louisiana, Florida, and Washington will have representatives at a September meeting, probably to be held in Texas. Purpose of the gathering would be to organize close support of the states' position in the prolonged tidelands dispute.

In the preliminary meeting Texas was represented by R. L. Bobbitt, chairman of the special tidelands committee of the Texas Bar Association; and Don Heard, assistant attorney general. Among those of the California delegation were E. W. Mattoon, deputy state attorney general; Rufus Putman and Stewart Waton of the state Land Commission; and Long Beach city and port officials.

Secondary-Recovery Study

BAKERSFIELD. — Secondary - recovery operations can be conducted economically in some areas of California, according to a report just issued by the Bureau of Mines covering experiments in the San Joaquin Valley.

The report covers studies of the Rio Bravo, Elk Hills, Kettleman North Dome, North and South Coles Levee, North Belridge, and Canal fields. These have demonstrated the economic value of gas injection, the report said, but because of complex problems not yet solved "no such definite statement" can be made about water flooding, it added.

Canada Sees Plenty of Oil

LOS ANGELES.—Canada will be producing enough oil within 5 years to be entirely self-sufficient.

This was the positive declaration made by N. E. Tanner, minister of mines and minerals for the Province of Alberta, at a luncheon assembly of oil-company officials sponsored by the Western Oil and Gas Association.

Canadian fields currently are supplying about 50 per cent of that country's demand, as compared with only 10 per cent in 1947, he said. Current production is only about 160,000 bbl. daily, but the fields are capable of producing 250,000 bbl.

Minister Tanner was a member of a group of 16 Alberta officials and business men who visited Los Angeles.

Wildcat Record Set

Operators completed 963 tests last month in spite of materials shortages to chalk up biggest July in history

John C. McCaslin

IN spite of steel shortages, the United States oil industry completed more wildcats in July than any previous July in history.

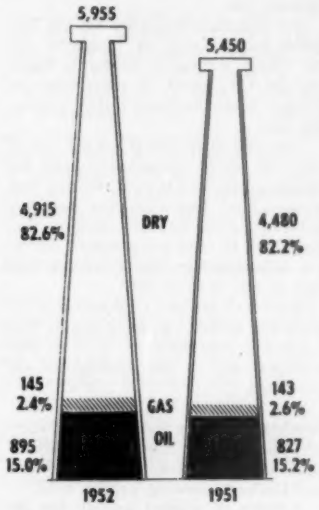
The month's total was 963, including 127 oil discoveries, 19 gas producers, and 817 dry holes. During the month operators drilled a total of 4,198,820 ft. in wildcat holes.

July's 963 wildcat completions represented 23 per cent of all wells completed during the month. For the first 7 months of the year, wildcats have accounted for 21 per cent of all completions.

Completions and footage by states, together with a comparison between figures for the first 7 months of this year and the same period last year, may be found in the accompanying tables.

Texas led all other states in July's wildcatting activity with 481 completions that included 74 oil discoveries and 11 gas strikes.

Kansas and Illinois tied for second with 68 completions, but Kansas recorded 12 strikes against only 2 for Illinois. Oklahoma placed third with 48 completions, 7 of which found oil.



Wildcat Exploration . . .

. . . First 7 Months

WILDCAT COMPLETIONS—JULY

	Total	Oil	Gas	Dry	Footage
Kansas	68	11	1	56	257,505
Oklahoma	48	7	0	41	220,922
Texas	481	74	11	396	2,261,123
North Central	218	37	1	180	685,967
West	94	25	1	68	521,580
Panhandle	11	3	2	6	71,639
East	30	0	1	29	167,489
Gulf Coast	58	4	3	51	462,464
Southwest	70	5	3	62	351,984
Louisiana	35	5	2	28	304,866
North	14	1	0	13	84,735
South	21	4	2	15	220,131
Mississippi	22	2	0	20	162,767
Rocky Mountains	47	3	0	44	249,037
Dakotas	3	0	0	3	15,172
New Mexico	12	2	0	10	63,296
California	46	5	1	40	163,855
Others	201	18	4	179	500,277
Total July 1952	963	127	19	817	4,198,820
Total June 1952	811	107	20	684	3,737,648
Total July 1951	919	127	25	767	3,844,884
Cumulative 1952	5,955	895	145	4,915	26,829,827
Cumulative 1951	5,450	827	143	4,480	22,735,997

WILDCATS, FIRST 7 MONTHS

	1952		1951	
	Total completions	Cumulative footage (1,000 ft.)	Total completions	Cumulative footage (1,000 ft.)
Kansas	498	1,927	537	1,905
Oklahoma	426	2,014	453	1,842
Texas	2,875	13,747	2,408	11,492
North Central	1,262	4,225	1,021	3,408
West	514	2,969	469	2,978
Panhandle	36	239	16	98
East	153	864	138	577
Gulf Coast	411	3,142	379	2,625
Southwest	499	2,308	385	1,806
Louisiana	205	1,828	188	1,461
North	87	509	99	494
South	118	1,319	89	967
Mississippi	192	788	71	516
Rocky Mountains	243	1,332	155	743
Dakotas	14	102	3	18
New Mexico	88	579	54	284
California	334	1,548	294	1,227
Others	1,080	2,965	1,287	3,248
Total	5,955	26,830	5,450	22,736

Rocky Mountains . . . No appreciable slowing down was noted in Rocky Mountain activity during July, although for a brief period there was some decline in number of new locations announced.

The Denver-Julesburg basin was the most active area in the region from the standpoint of new locations.

The search for Pennsylvanian and deeper production on the eastern and southeastern edges of the basin received a boost in July when a Wallace County, Kansas, wildcat reported probable Pennsylvanian shows. In Nebraska a Dundy County wildcat also found some Pennsylvanian shows.

The eighth producing pool in the general Sussex-Meadow Creek area of Wyoming was opened in July adding impetus to the ever-increasing development of that area.

Williston basin . . . Big news in the Montana portion of the basin during July was the announcement of Shell Oil Co.'s apparent new discovery on the southern end of the Baker-Glendive anticline at Little Beaver.

Shell announced the completion gage for the well as 280 bbl. of fluid daily, 12 per cent cut. Production is from Ordovician and is the southernmost discovery along the 110-mile span of the

Baker - Glendive anticline, extending production through this trend in Montana to the Bowman County, North Dakota, line.

An important discovery for the Williston basin region of Manitoba was the Tilston wildcat of California Standard Oil Co., about 25 miles south of Virden field, the basin's first producing area.

The wildcat flowed oil at the rate of 168 bbl. daily, presumably from the Mississippian, and is now awaiting tank construction. This Canadian discovery is located about 32 miles north of Bottineau, N. D., and is the second discovery announced for the Canadian portion of the basin in July.

Socony - Vacuum Exploration Co.'s Ratcliffe wildcat in southeastern Saskatchewan recovered free oil from Mississippian and is now drilling for the Devonian.

Southeast . . . The sixth Wilcox discovery this year in southwestern Mississippi was completed in July by Gammill-Cashion, opening Vernon field.

A wave of wildcat activity has begun in the eastern gulf coastal plain. Since the Pollard field discovery earlier this year in Alabama, a sudden revival of interest in the potentialities of the region has resulted. Three rank wildcats were staked in Florida and one in Georgia in July. Ten more wildcats have been announced, but not spotted, in the Florida-Alabama-Georgia area.

California . . . Activity in the vicinity of Richfield Oil Corp.'s recent 9,500-ft. Eocene discovery at Wheeler Ridge in southeastern San Joaquin Valley continues to grow. A total of six wildcats in July were drilling for the Eocene or Miocene in the general area.

Michigan basin . . . The trend of Michigan wildcatting will be toward stratigraphically deeper drilling, to test the basal Salina and Niagaran, especially on the rims of the basin where drilling will be shallower to this potential oil and gas reservoir than out in the basin.

The most recent stimuli for this lower horizon wildcatting was in July when Dow Chemical Co. found an estimated 12-15 million cubic feet of gas pay in the basal Salina at 4,212 ft. Panhandle Eastern Pipe Line Co. also found 15,000,000 cu. ft. of gas in the Salina. Two new Salina-Niagaran wildcat tests were announced in July for the western - northwestern rim of the basin, while one test was announced for the southeastern rim.

Oklahoma . . . Beaver County is experiencing a rapid buildup in wildcat activity following the Greenough and Beaver Panhandle field openings earlier this year. The most recent oil discovery is Carter Oil Co.'s 1 Dorman, which at the present time is shut in for tankage.

Before the well was shut in it was making 60 bbl. an hour through ¾-in. choke. This very successful wildcat increases the possibility of finding tremendous oil reserves in the general Panhandle portion of the Anadarko basin.

For a complete summary of all well completions in the United States and in Alberta, Canada, see page 215.

ROCKY MOUNTAIN

Wyoming Strike Looks Big

DENVER.—What promises to be the most important oil strike in Wyoming this year is being tested by G. H. Vaughan and Sinclair Oil & Gas Co. at their 1 Unit in the Dad area, Carbon County.

On a test of the Tensleep from 10,226-56 ft., the well made 4,575 ft. of green 45° to 50°-gravity oil in 65 minutes with no water.

The well is the first Tensleep test in the area south of Hatfield. It opened a broad area of the Green River basin to Tensleep possibilities.

Tensleep production at present is found at Lost Soldier, Wertz, and other major fields in the area. Stanolind Oil & Gas Co.'s recent discovery of Mesaverde oil at Middle Mountain plus this latest Tensleep find in Carbon County have placed the Green River and Washakie basins in the Rocky Mountain exploratory limelight.

Production Sets New High

TIOGA, N. D.—Production in North Dakota reached its peak to date for the week ended August 16.

The Beaver Lodge-Tioga areas now are producing about 5,000 bbl. of oil daily. Amerada Petroleum Corp. completed three more producers in Beaver Lodge field last week, bringing the total to 24.

Shell Oil Co. has completed the Little Beaver discovery in Fallon County, Montana, the southernmost strike along the more than 110-mile Baker-Glendive anticline, for a net 246 bbl. of oil daily from Ordovician.

Shell also has announced completion gages on three wells in the Richey area of Dawson and McCone counties. Shell completed 24-18 Schock flowing a net 278 bbl. of oil daily, the 31-25 E NPRR, pumping a net 50 bbl. of oil daily, and the 42-24 Berry for 295 bbl. of oil per day.

ECONOMICS

Crude Imports Up

Drop in products imports, however, offsets increase

COMBINED imports of crude and petroleum products into the continental United States were down 5,000 bbl. daily (net) in June over last month. Exports were up, averaging 93,000 bbl. daily more than during May.

These figures, released by the Census Bureau of the Department of Commerce, are tabulated in the accompanying table. They show increased imports of crude oil from every country from which crude is received.

Imports of crude oil during June were 70,000 bbl. higher than last month, but receipts of petroleum products were down 75,000 bbl. daily. Exports of crude, excluding shipments to territories, was up more than 22,000 bbl. daily over the May average. Exported petroleum products amounted to more than 365,000 bbl. daily during June, up 58,000 bbl. daily over May.

Imports of crude oil from Venezuela, major source of foreign oil for the United States, were up 15,000 bbl. daily compared to May, bringing the daily average for the month to 335,000 bbl.

IMPORTS INTO CONTINENTAL UNITED STATES
(Thousands of barrels)

	June 1925	May 1952	June 1951
Crude—			
Mexico	309	190	794
Colombia	1,334	1,037	1,491
Venezuela	10,040	9,577	9,401
Kuwait	2,680	2,617	3,056
Saudi Arabia	2,355	2,037	1,518
Canada	2	1	2
Borneo	451	111	225
Total crude	17,171	15,570	16,487
Daily average	572	502	550
Products—			
Residual fuel	8,929	10,990	8,682
Other products	989	*1,596	781
Total products	9,918	12,586	9,463
Daily average	331	406	315
Total all oils	27,089	28,156	25,950
Daily average	903	908	865

EXPORTS†	June 1952	May 1952	June 1951
Crude	2,388	1,718	2,342
Gasoline	1,836	*967	2,512
Kerosine	739	850	387
Distillate fuel	3,596	2,636	1,144
Residual fuel	2,587	2,500	2,471
Lube oils	1,306	1,449	1,407
Other products	923	836	898
Total all oils	13,375	10,956	11,161
Daily average	446	353	372

*Revised. †Excludes shipments to territories.

Bigger Refinery

Crude line leads Shell to expand plant at Vancouver

VANCOUVER, B. C.—Shell Oil Co. of Canada, Ltd., last week announced it will more than double the capacity of its 7,000-bbl. Shellburn refinery in North Burnaby, a Vancouver suburb.

W. M. V. Ash, company president, said construction will begin this autumn and is planned for completion in late 1953 to coincide with completion of the Trans Mountain crude-oil line.

The Trans Mountain line, now under construction, will deliver crude oil from Alberta fields to the Vancouver area. Shell is one of the owners of the line.

Ash said the refinery-expansion program will involve installation of a fluid catalytic cracking unit, a vacuum flasher, gas-recovery plant, and polymerization and treating units. New office buildings and shops will be erected, he said, and storage for products will be increased by 300,000 bbl.

Shell's Vancouver refinery now has a capacity of 7,000 bbl. a day and operates primarily on crude oil brought by tanker from California. It was built in 1932 with a capacity of 5,000 bbl. and was expanded in 1946. When the proposed expansion program is completed, it will have a capacity of 15,000 bbl. per day.

Shell's expansion program is the second to be announced for the Vancouver area as a result of construction of the Trans Mountain crude line.

Imperial Oil, Ltd., let a contract in April for the major portion of a $13,500,000 expansion program at its Ioco refinery. This project is scheduled to increase the Ioco refinery's capacity from 12,000 to 22,500 bbl. daily. The Ioco work also is scheduled for completion in the fall of 1953 *(The Oil and Gas Journal, April 28, page 53)*.

I.O.C.C. to Meet at Banff

BANFF, Sask. — Dr. K. A. Clark, conceded by many in the industry to know more than any other about the tremendous Athabasca tar sands oil reserve in northern Alberta, will present a paper on the huge deposit at the summer meeting of the Interstate Oil Compact Commission here September 1-3.

Clark, long-time director of oil-recovery studies for the research council of Alberta, will speak September 1 before the Secondary Recovery and Pressure Maintenance Advisory Committee of the commission.

The tar sands, believed to hold the world's greatest hydrocarbon reserve, have attracted the interest of the oil industry as a feasible economic venture only recently. This has been largely the result of the discovery of new recovery processes and of changing world conditions. At present about half a million acres overlying the deposit has been leased to companies for testing and development.

Principal address at the meeting, "Petroleum Conservation and Defense," will be delivered by Secretary of the Interior Oscar Chapman. Chapman intends to stress cooperation between states, the federal Government, and the Dominion of Canada in conserving oil and gas.

Standing committee of the I.O.C.C. will meet in all-day sessions September 1, with September 2 and 3 set aside for addresses, reports, and open-forum discussions.

Oil Aids Alberta

Petroleum revenues help yank province out of debt

EDMONTON, Alta. — The Alberta Government is continuing to reap a rich harvest from the oil play touched off by the Leduc oil discovery in the central part of the province in 1947.

A recent quarterly financial report for the 3 months ended June 30 shows the province had a $5,418,870 over-all cash surplus for the period, which was four times greater than for the same period last year.

During the 3-month period, the province received $20,563,872 in oil and natural-gas revenue. Of this, $9,452,724 was derived from the sale of oil and natural-gas lease rights, $4,272,392 from oil and gas fees and rentals, $2,528,892 from oil and gas royalties, and $4,309,864 from sale of school-lands mineral rights.

Debt slashed . . . Alberta's funded debt was reduced by $2,942,450 between June 30, 1951, and June 30, 1952. The funded debt stands at $95,050,037. It has been estimated that the province will be debt-free by 1973.

The last government sale of oil-lease rights at a public auction gave evidence that the oil revenues will continue to brighten Alberta's financial picture. Although no new records were set, the provincial government garnered $3,047,142 from the sale.

Largest purchaser in the latest sale was British American Oil Co., Ltd., which paid more than $1,000,000 for rights on three parcels of land.

A previous sale on May 22 yielded the government $12,881,436 for leases, of which a record breaking $3,110,000 was paid for a single quarter section.

The rights sold in the latest sale were on land in the Armena-Camrose field, 40 miles southeast of Edmonton.

Imperial Denies Expansion

SARNIA, Ont.—George L. Stewart, president of Imperial Oil, Ltd., has denied that his company has any definite plans for construction of a multimillion dollar light-ends unit here.

The possibility of constructing a major light-ends unit has been under review by the company for many years, but there is nothing immediate about it, Stewart said.

Automatic Station Operating

EDMONTON.—Imperial Pipe Line Co. has placed in operation the first automatic pump station in Canada.

The station is on the company's 8-in. crude-oil line which delivers to refineries here crude produced in Leduc-Woodbend, Golden Spike, and Acheson fields.

The new station is located about 5 miles southwest of Edmonton. Throughput of the line has increased about 7,000 bbl. daily to 36,000 bbl. since the station began operation.

Company Control Sought

CALGARY.—Canada Southern Oils, Ltd., is planning to acquire control of Illinois-Wyoming Oil Co., which has extensive producing and prospective holdings in northern Wyoming. Canada Southern, formed in 1951, already is operating in the United States through a new subsidiary, Canada Southern Oils, Inc., headquartered in Casper.

Drilling Rate High

REGINA.—Drilling this year in Saskatchewan is going on at a rate six times that of 1951, according to Resources Minister J. H. Brockelbank.

During the first 6 months of this year, a total of 430 wells were completed. In all of 1951 only 141 wells were drilled.

This year's first 430 included 90 wildcats, 119 development wells, and 221 core and stratigraphic holes.

Venezuelan Trade Pact Near

WASHINGTON.—A new reciprocal-trade agreement with Venezuela is slated to be signed in Caracas within the next few weeks.

Officials of neither government will discuss the salient features of the new pact, but it is generally expected it will provide for elimination of the present quota on imports of foreign oil into the United States and for a reduction of the import tax, now 10.5 cents per barrel on quota imports and 21 cents a barrel on all other, to 5.25 cents per barrel for crude and residual under 25° gravity and 10.5 cents for oil above this gravity.

Formal discussions of the new agreement began in Caracas last April 18 and were transferred to Washington July 16. Discussions have been concluded, the State Department announced. Formal negotiations will begin in Caracas in the near future, and the perfected agreement will be signed there.

Request for a new trade treaty was made by the Venezuelan Government when, following the abrogation in 1950 of the Mexican agreement which provided for a 10.5-cent import tax on all foreign crude and residual, the original quota provisions of the 1939 Venezuelan agreement, which had been suspended during the life of the Mexican pact, again became effective.

Product Exports Gain

WASHINGTON.—Exports of major products during the week ended July 25 averaged 215,700 bbl. daily, an increase of 23,700 bbl. over the preceding week and the highest average in 4 weeks.

The weekly report of the Petroleum Administration for Defense showed a sharp increase in distillate shipments accompanied by a substantial increase in kerosine and a sharp drop in motor gasoline and residual.

Details of the week's movement compared with the preceding week, and averages for the 4 weeks ended July 25 are shown in the accompanying table, in thousands of barrels.

	—Week ended— July 25	July 18	4 weeks July 25
Aviation gasoline	25.8	26.8	34.7
Motor gasoline	2.6	16.1	9.0
Kerosine	12.5	0.6	13.8
Distillate	134.1	57.1	76.6
Residual	40.7	91.4	60.0
Total	215.7	192.0	194.1

WATCHING WASHINGTON

Bertram F. Linz

What Awaits Congress

Much of the time of next year's session of Congress will have to be spent in determining what to do about the many laws directly or indirectly affecting the oil industry and other business that will expire in 1953.

A score of important statutes will be terminated during the year unless extended by Congress, many of them in the early months. They involve practically the entire mobilization program, and the fate of most of them will depend to considerable extent upon whether the next administration is Democratic or Republican.

Here are some of the more important laws on the list and the dates on which they will expire:

Price, wage, and rent controls and settlement of labor disputes, April 30; priorities and allocation of critical materials, June 30.

The President's special emergency powers, April 1.

The President's authority to propose reorganization plans for executive departments and agencies, April 1.

The Reciprocal Trade Agreements Act, June 12.

The President's authority to enter into, amend, or modify defense contracts, June 30.

The excess profits tax act of 1950, June 30; the increased rates of corporation and individual income taxes of the 1951 revenue act, December 31.

The President's authority to regulate exports, June 30.

The Selective Service's authority to draft 18½ to 26-year-olds and the President's authority to call up reserves, July 1.

Authority to renegotiate defense contracts, December 31.

Too Much to Spend

The national debt is now a mouth-filling $263 billion, but Uncle Sam is far from broke.

In fact, if he could shovel it out fast enough, there is a neat $164 billion available for spending this fiscal year, $73 billion appropriated by Congress for this year and $91 billion unspent from previous appropriations.

So the military, Mutual Security Agency, and the "regular" departments aren't too disturbed over a congressional economy drive. Only the emergency agencies and a few others that have no way of piling up a cushion are feeling the effects of cuts in appropriations.

That $91 billion carried over from previous years might offer a good target for an economy drive next year. It includes $21 billion that the Government hasn't even been able to obligate.

After the First Bomb . . .

Having pretty well filled its program for building new production facilities, the Defense Production Administration now is turning its attention to plans on what to do until the doctor comes in case of an enemy attack upon our industrial plants.

A "post-attack production staff" has been set up in the Office of Construction and Resources Expansion to develop plans for rebuilding industrial plants, operations during the rebuilding period, and implementation of such parts of those plans as can be carried out prior to attack, including the dispersion of facilities.

There has been a lot of industrial dispersion during the past 2 years, accomplished by the location of new plants rather than relocation of existing facilities. Its aim is to assure that a single enemy attack would not wipe out a large segment of any individual industry, but there are many areas where well-placed atom bombs would knock big holes in our economy.

The problem is not just one of rebuilding a single industry but to keep in operation other industries dependent upon it. The oil industry, for instance, might be seriously handicapped by the destruction of a few steel mills or fabrication plants, and so might the chemical industry and a score of other vital businesses.

HORTON STAINLESS CLAD REACTOR

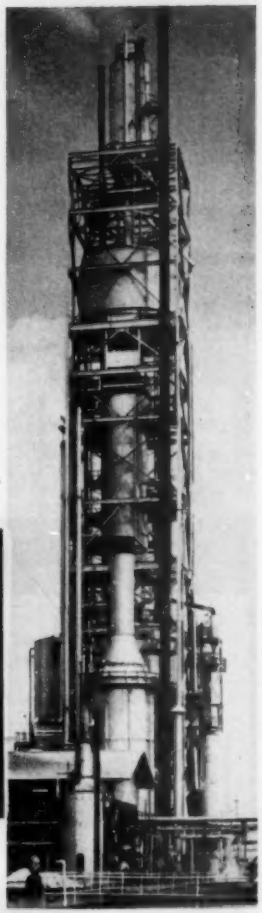
for Derby Oil and Gas Company

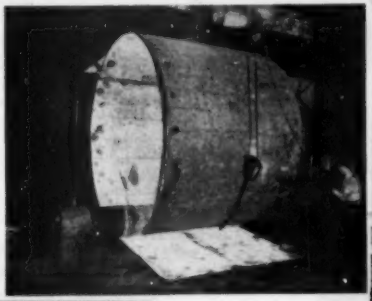
The Derby Oil and Gas Company of Wichita, Kansas recently revamped and modernized its refinery at a cost of over $3,000,000. The company re-equipped the plant to remain competitive, quality-wise, with other refineries in its marketing areas within the foreseeable future. The 11 ft. 5 in. diam. by 48 ft. stainless clad reactor, shown in the views below in various stages of construction, was built at our Birmingham plant for the new TCC Unit.

For years, Horton steel plate equipment has helped the petroleum industry keep pace with the ever-growing demand for its products. Horton steel plate work is carefully engineered and fabricated to meet exacting specifications embodying the most modern refinery principles.

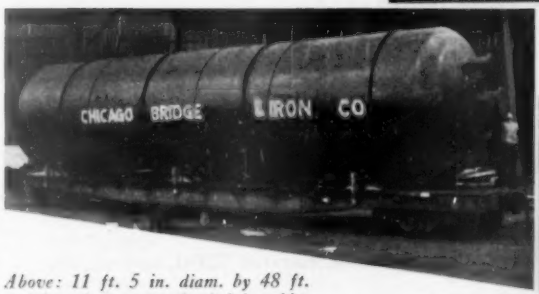
In addition to the stainless clad reactor for the TCC Unit, we also built a 29 ft. 9 in. by 17 ft. catalyst storage tank and a 5 ft. by 40 ft. catalyst tower for the TCC Unit. Other Horton equipment included in the improvements at the Wichita refinery are two refinery towers, a 10,000-bbl. Hortonsphere, a 25,000-bbl. tank with a Horton Floating Roof, and three 55,000-bbl. Horton tanks with floating roofs.

For further information on Horton structures for the petroleum industry, write our nearest office.

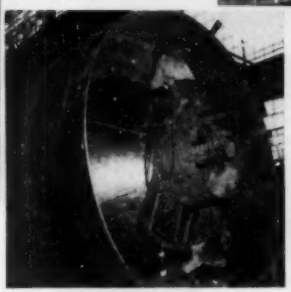




Right: Workman rolling stainless clad shell plates for the reactor. After this operation is finished the ends of the plates will be welded together.



Above: 11 ft. 5 in. diam. by 48 ft. stainless clad reactor loaded for shipment to the Derby Oil and Gas Company's Wichita, Kansas refinery.



Above: View of the new catalyst cracking unit at Derby Oil and Gas Company.

Left: Workmen attaching the catalyst distributor cone near the top of the reactor.

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Birmingham, 1.....1536 North 50th St.
Boston, 10.....1025—201 Devonshire St.
Chicago, 4.....2128 McCormick Bldg.
Cleveland, 15.....2204 Guildhall Bldg.
Detroit, 26.....1514 Lafayette Bldg.
Havana.....402 Abreu Bldg.
Houston, 2.....2119 C & I Life Bldg.
Los Angeles, 17.....1523 General Petroleum Bldg.
New York, 6.....3347—165 Broadway Bldg.
Philadelphia, 3.....1615-1700 Walnut Street Bldg.
San Francisco, 4.....1541—200 Bush St.
Seattle, 1.....1325 Henry Bldg.
Tulsa, 3.....1606 Hunt Bldg
Washington 6, D. C.....1139 Cafritz Bldg.

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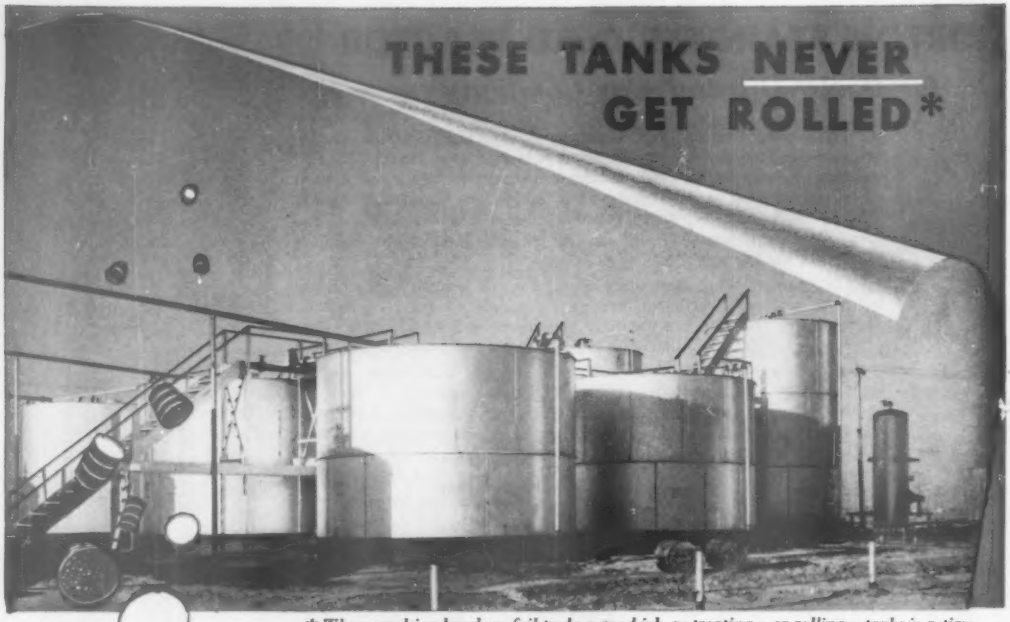

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World Production Up

Foreign crude output reached all-time high in June, even without Iran; new records set in Canada and Saudi Arabia

Dahl M. Duff

WORLD production of crude oil was back to a near normal level in June following the end of the strike in the United States industry which drastically reduced output the previous month.

Average production throughout the Free World (excluding Russia and other Communist countries) was 11,281,800 bbl. daily, up 11 per cent from the total in May. Including estimated Communist production, the June world total was 12,342,000 bbl. daily.

In the United States, production in June snapped back to approximately 6,150,000 bbl. daily. This was 1,042,200 bbl. daily greater than the depressed level during May when many strike-closed refineries were forced to stop crude shipments. Despite this sharp increase, June production in the United States was still about 280,000 bbl. daily below the pre-strike level in April.

Foreign output high . . . Foreign production has continued its steady upward climb, and the marked fluctuations in the world total were due almost wholly to the changes in the output of the United States. During May, United States production dropped to slightly less than 51 per cent of the non-Communist world total; in June, this figure was back 54.7 per cent.

The total foreign production in June

TREND OVER THE LAST YEAR

	Western Hemisphere less U. S.	Middle East	Total foreign less Russia and E. Europe
July	2,374.5	1,835.5	4,578.0
August	2,388.0	1,789.7	4,555.3
September	2,396.3	1,741.7	4,517.6
October	2,395.6	1,810.6	4,585.6
November	2,383.7	1,940.4	4,709.5
December	2,404.9	1,846.3	4,633.1
January	2,432.3	1,832.8	4,653.5
February	2,438.8	1,860.1	4,692.0
March	2,437.8	1,996.5	4,813.8
April	2,459.6	2,090.8	4,933.2
May	2,527.6	2,142.1	5,059.9
June	2,523.2	2,208.9	5,132.8

WORLD CRUDE-OIL PRODUCTION
(In thousands of barrels daily)

Country—	June 1952	May 1952	June 1951
Western Hemisphere:			
Argentina	67.0	67.0	70.9
Bolivia	1.6	1.5	1.4
Brazil	1.8	1.7	1.4
Canada	190.3	173.7	157.3
Chile	2.2	2.2	2.1
Colombia	108.5	107.8	109.0
Cuba	0.1	0.1	0.3
Ecuador	7.8	7.8	7.3
Mexico	216.4	218.7	210.6
Peru	45.5	45.5	46.4
Trinidad	57.4	57.2	55.5
Venezuela	1,824.6	1,844.4	1,699.4
Total	2,523.2	2,527.6	2,361.6
Europe and Africa:			
France	7.3	6.7	5.7
French Morocco	2.4	2.2	1.7
W. Germany	34.4	32.7	26.3
Italy	1.0	0.9	0.4
Netherlands	13.7	13.9	14.0
Egypt	45.0	45.0	47.1
United Kingdom	1.0	1.1	0.9
Total	104.8	102.5	96.1
Middle East:			
Bahrein	30.0	30.0	30.0
Iran	31.0	30.6	637.4
Iraq	418.6	402.1	171.0
Kuwait	763.0	778.0	528.5
Qatar	67.0	64.9	45.4
Saudi Arabia	899.0	836.2	758.7
Turkey	0.3	0.3	0.1
Total	2,208.9	2,142.1	2,171.1
Other Asia:			
British Borneo	106.0	106.0	102.0
Burma	2.2	2.2	1.3
India	5.0	5.0	5.0
Indonesia	168.0	160.0	153.0
Japan	6.0	5.9	7.5
New Guinea	4.8	4.8	4.8
Pakistan	3.9	3.8	3.0
Total	295.9	287.7	276.6
Total foreign less Russia and other Communist-controlled areas	5,132.8	5,059.9	4,905.4
United States	6,149.0	5,106.8	6,129.9
Total, non-Communist areas	11,281.8	10,166.7	11,035.3
Est. Russia and other Communist areas:			
Austria	45.0	45.0	37.0
Romania	90.0	90.0	85.0
Russia	900.0	900.0	800.0
Other Communist areas	24.8	24.8	24.3
Total	1,059.8	1,059.8	946.3
World total	12,341.6	11,226.5	11,981.6

Figures are from reliable reports in the industry or official government sources. Data for Russia and Eastern Europe are based on competent estimates; no authentic information is available on month-to-month production in these areas. Completely current reports also are lacking for certain countries of Southeast Asia. Data for earlier months have been revised where necessary. "Other Communist areas" comprise Albania, China, Czechoslovakia, Hungary, Poland, and Yugoslavia.

of 5,132,800 bbl. daily compares to 5,059,900 bbl. daily in May and 4,933,200 bbl. daily in April. Despite the loss of Iran last summer, foreign crude oil production is now at an all-time high and is expected to continue to climb with sharp increases in demand abroad and large-volume imports into the United States.

The Middle East in June for the first time exceeded in total production reached prior to the Iranian shutdown. The June output of 2,208,900 bbl. daily was slightly above the previous record of 2,203,800 bbl. daily in May 1951. The earlier record was set in a month when Iran produced 717,100 bbl. daily. After Iranian exports were halted, production in the Middle East dropped to 1,741,700 bbl. daily last September. Since then, the total has been moving back toward the former high.

Several countries established new production records in June. They included West Germany, Canada, and Saudi Arabia. Canadian production has been edging up toward the 200,000-bbl. daily mark. The preliminary June total of slightly more than 190,000 bbl. daily was 9.6 per cent above May.

Venezuela down . . . The slump in demand for heavy fuel oil in the United States, due to the summer season and the steel strike forced a decline in the high rate of production which Venezuela has been maintaining for more than a year.

Output in the country fell nearly 20,000 bbl. daily, and officials of the Mines and Hydrocarbons Ministry in Caracas were doubtful if the country's oil production will now reach 2,000,000 bbl. daily by the end of the year. For the first half of 1952, Venezuela production averaged 1,826,500 bbl. daily compared with an average during 1951 of 1,704,600 bbl. daily.

Other changes in production among countries in the Western Hemisphere were relatively minor. Mexican production was down slightly during the month. Colombia's output of 108,482 bbl. daily included of the following production by concessions: Empresa (De Mares), 34,636 bbl. daily crude and 2,285 bbl. daily condensate; Barco, 26,990 bbl. daily; Yondo, 37,468 bbl. daily; Cantagallo, 940 bbl. daily; Dificil, 1,371 bbl. daily; and Velasquez, 4,792 bbl. daily.

The principal increase in production in the Middle East was in Saudi Arabia which averaged 899,000 bbl. daily during June. This was 62,800 bbl. daily, or 7.5 per cent, above the production in May, and 2,300 bbl. daily above the previous record of 896,700 bbl. daily in November of last year. Output in Kuwait, the second leading producer in the Persian Gulf, was down slightly. Iraq production was again at a new record due to the operation of the new 30 and 32-in. line to the Mediterranean. Further gains are anticipated in coming months after further work on new pumping facilities.

In the Far East, Indonesian production, at an estimated 168,000 bbl. daily in June, was showing the effects of the commencement of commercial operations at Caltex's Minas field in central Sumatra. The approximately 13,300 bbl. daily produced by Caltex's subsidiary in June was a further addition to the output of the two existing operators, Standard - Vacuum and Shell. Shell is the largest producer in Indonesia with an output of about 85,000 bbl. daily.

MIDDLE EAST

Records in Iraq

New drilling, production marks set during 1951 by Iraq Petroleum as company experiences one of its best years

NEW records in both footage drilled and oil produced were established in 1951 by Iraq Petroleum Co., Ltd., in what was one of the most eventful years of progress in the company's history.

Operationally, I.P.C. and its two associated companies in Iraq last year laid much of the new 30 and 32-in. pipe line from Kirkuk, expanded field facilities at Kirkuk, and brought the new Zubair area on production with continued development. Also of major importance was the new agreement with the Iraq Government under which profits from operations in the country will be shared equally.

The achievements of the three I.P.C. companies in Iraq last year have been reviewed in a 32-page illustrated brochure published by the company in London. It describes company activities, outlines the new profit-sharing agreement, and tells the story of the construction of the new 30 and 32-in. line to the Mediterranean.

The three companies are I.P.C. itself; Basrah Petroleum Co., Ltd., operating in southern Iraq, with Zubair field; and Mosul Petroleum Co., Ltd., which is now laying a 12-in. line from Ain Zalah field to Station K-2 on the I.P.C. system.

Drilling data . . . In 1951, the three companies achieved a total footage of 124,088 ft., 12,000 more than the previous record in 1950. A total of 26,119 ft. were drilled in the I.P.C. concession, and the two rigs employed in the Kirkuk field at the end of the year were drilling at 3,374 ft. and 6,267 ft.

B.P.C. drilled 90,833 ft. in Zubair, where completion depths are greater than in any other major field in the Middle East. Seven wells were completed during the year at between 10,000 and 11,000 ft. In the Mosul concession, 7,236 ft. were drilled during the year, making a total of 81,372 ft. since the commencement of operations in the concession. Two wells were completed in Ain Zalah field at depths of

British Wildcat

This derrick marks the location of the latest test in the continued exploration of the United Kingdom by D'Arcy Exploration Co., Ltd. (Anglo-Iranian Oil Co., Ltd.). The well was scheduled to spud in recently on the Isle of Wight in the English Channel off Southampton. The location is in the center of the island, about a half mile southwest of the village of Arreton. Britain, which now ranks as the leading refining country in Western Europe, produces only about 1,000 bbl. of crude daily. Oil exploration since the war has turned up some other minerals, including coal and potash, but no additional petroleum.

9,713 ft. and 10,164 ft., and a test at Butmah was under way.

Total Kirkuk production in 1951 was 7,980,600 tons (about 60,000,000 bbl.). Zubair commenced export December 21, and by the end of the year, 33,800 tons had been shipped. An additional line to the Fao terminal, 24-in. in diameter, is planned, and the program calls for shipping a minimum of 8,000,000 tons a year (about 165,000 bbl. daily) from Zubair from the end of 1955.

Where money goes . . . Commenting on the 50-50 agreement negotiated last year, the report pointed out that under an act passed in 1950 by the Iraq Parliament, 70 per cent of the government's oil revenues will be devoted to capital schemes to raise living standards.

Talks May Be Resumed

British reply to Mossadegh offer to talk over compensation for A.I.O.C. to suggest negotiations on over-all settlement

THE British Government is preparing to suggest to Iran that negotiations again be undertaken in an effort to reach an over-all settlement of the oil dispute.

This will be the British reply to Prime Minister Mossadegh's offer to discuss compensation for Anglo-Iranian Oil Co., Ltd., and other issues within the framework of Iran's oil-nationalization law.

The form of the British counter offer has been under consideration in London since the early part of the month. Consultations have been under way with United States officials, who have been urging some attempt at settlement because they fear the country may be taken over by its own Communist party if Dr. Mossadegh's government is not shored up with revenue from some source.

The possibility of negotiations in itself gives rise to faint hope that the dispute will be resolved and the Iranian industry brought back into production. However, there is nothing to indicate either side is ready to compromise on fundamental issues. All the British seem ready to do is to talk over all phases of the dispute on a broad basis.

Turn about . . . Dr. Mossadegh's note to the British set out that Iran was ready to discuss compensation for the nationalized properties. It proposed that the question go before Iranian courts, if an agreement were not reached. Furthermore, the discussions would be with company, and not British Government, representatives.

At the same time, the Iranian leader laid claim to sums running into millions of dollars which he said were due Iran. He demanded that Anglo-Iranian give Iran the money which the company originally set aside to pay the government in case the 1949 agreement raising royalties was ratified. The agreement was never approved by the Iranian parliament, which instead voted to take over the properties. Dr. Mossadegh also demanded that Britain release blocked Iranian funds in Britain.

In some quarters, these demands were regarded as an effort to offset Anglo-Iranian's claims for compensation. Various estimates of the value of the company's holdings in Iran have been made, including one evaluation of around a billion and a quarter dollars. They depend, of course, on the basis used for the figures—original or replacement value, crude oil in the ground, etc.

A solution to the oil problem is tied more closely than ever to internal developments in Iran and also to the general international policy of the United States and Britain. In an apparent effort to strengthen his position and undermine the Communist platform, Dr. Mossadegh has instituted an almost revolutionary program of land reform. He acted under his new decree-law powers.

World Briefs

The Jabal Ali wildcat of Petroleum Development (Trucial Coast), Ltd., has been abandoned at 12,352 ft. The well was located in the shaikhdom of Dubai about 300 miles east of Qatar and a short distance back of the Persian Gulf shore *(The Oil and Gas Journal, December 27, page 44)*. It was the second unsuccessful test by this Iraq Petroleum Co., Ltd., associate. Another location at Murban in Abu Dhabi is now being prepared.

Acreage in the north-central Mexican State of Chihuahua for percentage-of-production drilling contracts is being sought in Mexico City by a Hobbs, N. M., drilling company represented by L. T. Holt, according to reports from Mexico City. If the company is able to reach agreement with the government agencies on the letting of the contracts, it expects to move five rigs into northern Mexico the first year. The company is planning to file its application with Petroleos Mexicanos as soon as its attorneys form a legal Mexican corporation.

A group of officials and technicians of Anglo-Iranian Oil Co., Ltd., was scheduled to leave London last week for Aden where they will discuss construction of the proposed 100,000-bbl.-daily refinery with the Adenese Government. Preliminary surveys for the plant have been made, but decisions must be made on a number of other questions connected with the project. No contracts have yet been placed. The refinery is estimated to cost about $140,000,000.

An important oil discovery south of the Golden Lane area in Mexico has been reported by Petroleos Mexicanos. The well, Ezequel Ordonez 2, was producing at a rate of about 5,000 bbl. daily, according to reports from Mexico City. Eighteen of an estimated 65 ft. of productive strata was penetrated. Pemex geologists said the well may extend the Golden Lane fields 60 miles south of their former limits.

Mexican American Independent Oil Co. (CIMA) is abandoning its latest exploratory well in southern Mexico, Macuiltepec 1. Testing gave noncommercial results, and the equipment is being moved to the No. 2 location. Macuiltepec 1 reached 5,636 ft. late in July.

An Australian company, Enterprise of New Guinea Gold & Petroleum Development, has increased its capital to the equivalent of more than $1,000,000 in an effort to obtain a permit from the Australian Government to explore in the Sepik River district of northern New Guinea. The company was previously turned down on its permit application because of lack of financial and technical resources. In Papua in southeastern New Guinea, Anglo-Iranian Oil Co., Ltd., and Standard-Vacuum Oil Co. have for several years been carrying out joint drilling and exploration in a thus-far unsuccessful program to find commercial production.

Texas Petroleum Co. plans construction of a 21-mile, 4-in. crude line from Tetuan field in the Upper Magdalena Valley to Guamo where a topping plant will be built to process Tetuan and Ortega crude. The new plant will permit full commercial tests of the wells. Texas Petroleum now has four producers and one drilling well in Tetuan, and two completed producers in the nearby Ortega area.

something new has been added to well treating

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Jel-X Services are fast! Many treatments take little more than an hour; the longest treatments are usually made in less than six hours. Rig-time is held to a minimum. Most chemicals arrive at your well mixed and ready to use. What's more, shut-in time is unnecessary after treatment.

Dowell's Jel-X Services are a growing family with a variety of types to fit many different well conditions. Call the Dowell station near you for complete information.

Here's the Dowell Jel-X Family

ETCHING ACID—Jel-X 100 has proved effective for use in limestone and dolomite formations with either fractured or vugular porosity. It is designed to etch and enlarge fractures or "vugs"; clean fractures by removing mud, silicate and feldspar materials; penetrate formation farther from the well bore than ordinary acid.

CHANNELING ACID—Jel-X 200 has proved effective in limestone and dolomite with some intergranular porosity. It is designed to form channels deep into pay formations. These channels permit the entrance of acid into zones far from the well bore, reaching production that might otherwise be untapped.

STRATA-LIFT—Jel-X 400 has proved effective in problem wells completed in dense limestone or dolomite. It is designed to open new fractures and extend old ones, and to dissolve soluble portions of the formation. Strata-lift may carry suspended sand which operates as a propping or abrading agent.

STRATA-FRAC—Jel-X 500 has proved effective in sandstone, chert, chat and conglomerate formations. It is designed to dissolve soluble materials including silicates, paraffins and other heavy hydrocarbons; and to open new fractures or enlarge old ones. Strata-frac carries suspended sand as a propping or abrading agent; needs no following jel-breaker solution.

TEMPORARY PLUGGING SERVICE—Jel-X 700, 800, 810 and 900 are very viscous solutions which have proved effective in selective acidizing. They are designed to shut off the more permeable zones, permitting acid to be injected into the tighter formations. They are particularly useful in wells having multiple zone completions.

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FOR OIL INDUSTRY CHEMICAL SERVICE

Calderwood Returns

Resumes Shell post after 3-year assignment abroad

A H. CALDERWOOD has returned to New York as manager of manufacturing for Shell Oil Co. following a special assignment in England.

Since 1949 he has assisted in organization and engineering problems during the major expansion of Shell's Stanlow and Shell Haven refineries in Britain.

Calderwood, who has a degree in mining engineering, joined Shell in 1923 as an assistant inspector in the purchasing department in Los Angeles. Later he served in various craft jobs in the Wilmington refinery and was promoted to maintenance foreman there in 1926.

In 1932 he was transferred to the Martinez refinery as assistant manager and became manager in 1938.

He returned to the Wilmington refinery in 1942 as manager. In 1946 he was appointed manager of manufacturing for all Shell's West Coast refineries, with headquarters in San Francisco. Three years later he was named to his present position in New York and shortly afterwards was sent to England.

Charles H. Row, area geologist for Sun Oil Co. at Corpus Christi, has been appointed regional geologist at Dallas. He will be in charge of the Corpus Christi, McAllen, and San Antonio districts.

Stuart Noah, Albion, Ill., drilling contractor, has been named president of the Illinois basin chapter of the American Association of Oilwell Drilling Contractors.

A. J. Williams has been appointed assistant to the oil and gas conservation officer in the department of natural resources of Saskatchewan. He formerly was head of the resources-utilization branch of the resources department. **R. V. Tomkins,** who has been serving as principal research engineer, will succeed him.

Ken M. Doze has been elected vice president in charge of production of New British Dominion Oil Co., Ltd., at Calgary. Previous positions include that of general superintendent for Oil Ventures, Ltd., Pacific Petroleums, Ltd., and Central Leduc Oils, Ltd., and Associates, and manager of exploration for Saskatchewan Federated Co-operatives, Ltd.

H. A. Ricards, of Standard Oil Development Co., Linden, N. J., has been promoted to head the newly formed petroleum cracking section of the process division. His assistant is **Robert Hardy. John Weikart** has been named to Ricards' former position as assistant head of the process division's white products and fuels section.

W. J. Ricketts has been promoted to head the distillation, asphalt, and chemical products division of Esso Standard Oil Co.'s Bayonne, N. J., refinery. He is succeeded by **H. E. Hartman** as supervisor in the oil conservation division.

Joseph H. Ellender, assistant manager of the economics department of The Texas Co., has been appointed chief economist for Arabian American Oil Co.

M. A. Wright has been elected executive vice president and director of Carter Oil Co. Wright, who is now serving as executive vice president of International Petroleum Co., will assume his new duties in Tulsa October 1. He was appointed chief petroleum engineer for Carter in 1943 after serving in various engineering capacities in Oklahoma and Louisiana. A year later he became assistant manager of the production department. In 1946 he was named an executive assistant in the producing coordination department of Standard Oil Co. (N. J.) in New York and became deputy coordinator of world-wide producing activities in 1949.

William C. Kirkpatrick, who joined International Petroleum Co., Ltd., in 1924 as an accountant, has been appointed manager for Andian National Corp., which operates a 335-mile crude line from De Mares to the Caribbean in Colombia. He succeeds **C. T. Anderson,** who is now living in San Antonio, Tex.

Richard A. Barton, Jr., field engineer for The Texas Co. at Nocona, Tex,. has been promoted to assistant district engineer at Wichita Falls, Tex.

K. M. WATSON

Dr. Kenneth M. Watson, Chicago, who has operated a consulting service the past 2 years, has been appointed director of research for Pure Oil Co. He will be located in Pure's research and development laboratories in Crystal Lake, Ill., where he succeeds the late **William B. Ross.** He has served as consultant to the War Production Board, the Office of Rubber Reserve, and various industrial clients. He was technical adviser to the President's Interagency Committee on Carbon Black in 1945.

Robert J. Bradley, Dallas, has been elected president and a director of Mazda Oil Corp., a subsidiary of National Phoenix Industries, Inc., New York. He also is president of San Juan Oil Co., which operates in the Mid-Continent area. He formerly was in charge of petroleum economics for De-Golyer & MacNaughton, Dallas consulting firm.

Alberto Vargas has been appointed by the Colombian Government as director of the fiscalization and exploitation section of the Ministry of Mines and Petroleum succeeding **L. T. Burgos,** who has resigned to join Empresa Colombiana de Petroleos.

Marshall F. Stiles, Jr., has been placed in charge of the new field office opened in Shreveport by the U. S. Geological Survey. He formerly was located in Tulsa.

R. B. B. Wrixon, operations superintendent for Shell in Colombia, has been transferred to the Maracaibo operations of Shell in Venezuela. **K. Davidson,** who has been serving as chief exploitation engineer for Shell at Bo-

PERSONALS

gota, has been transferred to Maracaibo. He has been succeeded by **J. C. Reynierse**, formerly in Dificil and Casabe fields.

W. H. Dixon, field superintendent for American Republics Corp. at De Quincy, La., has been appointed district superintendent at Lafayette, La.

Robert L. Sprinkle, Jr., has joined the oil-development department of Northern Pacific Railway Co. at Billings, Mont., as chief petroleum geologist. He recently resigned at Long Beach as district geologist for Shell Oil Co. in the Los Angeles Basin. Before joining Shell in 1938 he spent 4 years on geological and engineering projects in California and a year doing exploratory work in the Philippines.

B. G. Hubner, district seismologist for Atlantic Refining Co., has been transferred from Midland, Tex., to Corpus Christi.

Victor Hugo King, formerly an instructor at Michigan State College, East Lansing, has been appointed a geophysicist for Atlantic Refining Co. at Freer, Tex.

Jack Collier, toolpusher for Cook Drilling Co., Fort Worth, has been transferred from Nocona, Tex., to Riverton, Wyo.

John F. Binkley has resigned as district engineer for Sunray Oil Corp. at Corpus Christi to become production foreman for J. Ray McDermott & Co., Inc., at Sheridan, Wyo.

Carey F. Ramsey, assistant manager of the products-acceptance department of Standard Oil Co. of California, will resign September 1 to become a vice president of Faber Laboratories of New York. He formerly was chief chemist for Standard.

A. H. Vallat has been appointed general manager for Triad Oil Co., Ltd., Calgary, Alta. For the past 3 years he has been district geologist for Ohio Oil Co. in western Canada. He previously directed exploration activities for Continental Oil Co. of Delaware.

William H. Ward, engineering trainee for Sohio Petroleum Co. at Oklahoma City, has been promoted to junior engineer at Lafayette, La.

Lewis L. Barnes has been appointed a petroleum engineer for Stanolind Oil & Gas Co. at Tulsa. He formerly was with Reed Roller Bit Co. in Odessa, Tex.

Lawrence H. Smith, district geologist for Pure Oil Co. at Denver, has been transferred to Oklahoma City. **Lewis M. Perry** has been transferred from the Illinois division to Denver as district geologist.

G. W. Crickmay, assistant resident manager of operations for Atlantic Refining Co. in Caracas, Venezuela, has been appointed manager. He joined Atlantic in 1946 as senior field geologist for Venezuelan operations in the foreign crude-oil production department. In 1949 he was named geological coordinator.

John Emery Adams, Standard Oil Co. of Texas, Midland, and **Jesse V. Howell,** consulting geologist, Tulsa, have been nominated for the presidency of the American Association of Petroleum Geologists for 1953-54. Other nominees are: **Glenn C. Clark,** Continental Oil Co., Oklahoma City, and **Leslie M. Clark,** Pacific Petroleums, Ltd., Calgary, Alta., for vice president; **Clarence E. Brehm,** consulting geologist, Mount Vernon, Ill., and **Elliott H. Powers,** Southern Production Co., Fort Worth, for secretary-treasurer. **George V. Cohee,** U. S. Geological Survey, Washington, D. C., and **Armand J. Eardley,** University of Utah, Salt Lake City, for editor of the association's monthly bulletin. Voting on the nominees will be by secret ballot and the results will be announced in February.

L. C. Brunstrum has been appointed section leader in the research department of Standard Oil Co. (Ind.) laboratory at Whiting, Ind. Other appointments include: **H. J. Liehe,** group leader, greases; **A. W. Lindert,** section leader, and **R. S. Barnes,** group leader, industrial lubricants; **T. B. Tom,** section leader, and **R. A. Hunt,** group leader, light oils; **R. A. Dinerstein,** group leader, fractional distillation and hydrocarbon analysis; **M. Den Herder,** group leader, catalyst research, and **J. W. Mohlman,** group leader, information services. Appointments in the technical division include **M. Gordon,** section leader, light and heavy oils finishing and asphalt manufacture; **R. B. Selund,** section leader, distillation, coking, heavy oils processes, and acid manufacture; **W. E. McGinnity,** group leader, heavy oils processes and acid manufacture, and **E. R. Walter,** section leader, and **G. M. Goodman,** group leader, economics.

Herbert D. Thornton has been appointed general superintendent at Denver of McElroy Ranch Co., Fort Worth, in the Rocky Mountain area. He formerly was with Shell Oil Co., Phillips Petroleum Co., and A. O. Smith Corp.

Edward Dolezal, chief mechanical engineer for Phillips Chemical Co. at Bartlesville, Okla., has been appointed to the newly created post of chief project coordinator. Other changes include: **Austin Morgan,** assistant chief mechanical engineer, appointed to succeed Dolezal; **T. M. Hipp,** on special assignment on an ammonia plant construction project near Houston, transferred to Bartlesville and assigned to the newly created post of chief construction engineer; **M. W. Bennett,** office manager at Bartlesville, assigned to the newly created post of chief economics engineer, and **M. W. Monk,** assistant office manager, appointed to succeed Bennett.

Robert I. Dickey, Midland, Tex., regional exploration manager for Forest Oil Corp. in West Texas and New Mexico, has been named a vice president. Before joining Forest in 1939 he was a geologist for 5 years in Midland for Stanolind Oil & Gas Co.

Hobson S. Mann, field engineer for Sunray Oil Corp., has been transferred from Jennings, La., to Victoria, Tex.

John Simon and **John Higgins,** geologists for Ohio Oil Co., have been transferred from Hobbs, N. M., to Midland, Tex. New geologists in the company's Midland office include: **Raymond Holasek, Ed McGee, Nelson Webernick, Julian Walker,** and **A. T. Carleton. Joe Mac Parsley** has joined the Midland office as a petroleum engineer.

Dr. John R. Bates has been appointed to the newly created position of technical advisor to the executive committee of the board of directors of Sun Oil Co. His duties, in charge of the chemical research and development departments, have been assigned to **Dr. J. Bennett Hill,** director of that department. Dr. Bates has resigned from

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PERSONALS

Sun's board of directors but will continue to serve on the military fuels technical advisory committee to the Petroleum Administration for Defense.

G. Bullitt Williams, formerly a petroleum engineer for J. M. Huber Corp. at Borger, Tex., has been appointed district petroleum engineer for Bay Petroleum Corp. at Oklahoma City.

W. B. BERWALD

W. B. Berwald, assistant chief petroleum engineer for Ohio Oil Co. at Findlay, Ohio, since 1946, has been transferred to Shreveport as assistant manager of the production division there. Berwald joined the company in 1939 as division petroleum engineer in Tulsa. **W. H. Barlow,** petroleum engineer, will succeed him in Findlay.

Cyril J. Perusek has resigned as a geologist for Residue Research Laboratories at Midland, Tex., to become a geologist for Phillips Petroleum Co. there.

Emerson Bradley has been transferred by Lion Oil Co. from El Dorado, Ark., to Shreveport, La., as administrative assistant to the manager at Lion's new regional office. Others transferred from El Dorado to Shreveport include: **W. C. Dennis,** regional geologist; **T. Frank Davis,** regional production superintendent; **John E. Gaffney,** district geologist; **J. G. Ragsdale, Jr.,** regional engineer; and **J. Martin Allen,** geologist.

A. J. Perks, assistant fields manager (technical) of Basrah Petroleum Co., Ltd., in Iraq, has been appointed fields manager. Perks joined Asiatic Petroleum Corp. in 1933 and went to Iraq Petroleum Co., Ltd., in Kirkuk when production began in that field. He later joined B.P.C. as production superintendent and handled the initial operations from Zubair field. **T. S. Coggan,** who has had a long career in foreign drilling operations, has been made assistant fields manager of the Basrah company. Coggan went to the United States from Argentina in 1925 and joined the Standard Oil Co. (N. J.) organization, subsequently working in Venezuela, Argentina, Egypt, and the West Indies. He joined B.P.C. in 1947.

Russell Maguire, independent producer, is head of a group which has purchased American Mercury Magazine. He has large holdings in Texas and other states.

H. V. Ward, production engineer for Pan American Production Co. at McKinney, Tex., has been promoted to district production foreman at Dickinson, Tex.

W. E. Mueller, Houston, has been elected executive vice president of Colorado Interstate Gas Co. He also will serve as executive vice president of Colorado Oil & Gas Corp., a wholly owned subsidiary of Colorado Interstate. He will resign soon as senior vice president and director of Tennessee Gas Transmission Co., of Houston, and as director of Tennessee Production Co., an affiliate of Tennessee Gas.

James E. Skidmore, engineering trainee for Phillips Petroleum Co., has been transferred from Eureka, Kans., to Odessa, Tex.

Roger Bassett has been appointed district geologist at the new district office opened in Shreveport by Pan American Production Co.

J. B. (Jake) Higginbotham, superintendent for Sun Oil Co. at Hebronville, Tex., has been appointed superintendent at Silver, Tex., succeeding **C. C. Bengston,** who has been transferred to Calgary, Alta., as general manager. Other changes include **J. L. Legg,** foreman, transferred from Silver to Kermit, Tex.; **H. L. Bethancourt,** foreman at Kermit, transferred to the engineering department at Dallas, and **I. C. Snead,** foreman, transferred from Silver to Snyder, Tex.

DEATHS

W. W. Silk, 77, who is credited with discovery of the Hull-Silk pool in Archer County, Texas, and was an associate of the late Frank Kell in forming Deep Oil Development Co., died August 15 in Wichita Falls, Tex.

Elmer E. Adams, retired independent oil man, died August 15 at his home in Tulsa. He was engaged in the oil business in Wichita before coming to Tulsa.

Charles O. Thrasher, 59, president and founder of Angelus Steel Treating Corp., died August 5. He was a pioneer in hardening of oil-field tools during the Signal Hill boom in the 1920's.

James L. Moravy, 18, driller for Gordon Drilling Co., was killed in an automobile accident in Clare County, Michigan, August 13. He was the son of Herbert Moravy, president of Gordon Drilling Co.

Charles Edward Heyl, Sr., 66, Greenport, N. Y., manager of the inland-water division of the marine-transportation department of Socony-Vacuum Oil Co., Inc., died August 14 in Eastern Long Island Hospital, Greenport.

Dr. E. W. Bodine, 46, in charge of the agricultural-products-development section for the western division of Shell Chemical Corp. in San Francisco, died at his home there August 11.

Benjamin C. Denman, 60, sales manager for the West African division of Socony-Vacuum Oil Co., died August 10 in Paris.

Lt. Col. L. D. M. Baxter, 62, director of several oil companies in western Canada, died recently in Winnipeg, Ont.

William W. Stabler, 61, oil financier, died in Los Angeles August 13.

Harrison R. Ward, 81, retired oil producer, died August 7 in a Pasadena, Calif., hospital.

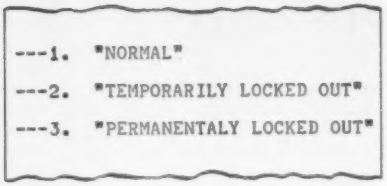
John Sanford Hale, 52, chief clerk in the pipe-line department of Gulf Refining Co., died August 17 at Tulsa.

Ralph C. Fleming, 52, former Tulsa core-drilling contractor, died August 14 in a Wichita hospital.

Sheldon Clark, 75, chairman of the board of Sinclair Oil Corp., died August 15 in Chicago. He joined Sinclair after the firm acquired Cudahy Refining Co. in 1916. He was named to the board in 1925 and became chairman in May 1951. He was a director of Richfield Oil Corp., Western Petroleum Refiners Association, and the National Petroleum Association.

James Marshall McQuiston, 84, early oil driller and contractor, died August 14 at his home in Venango County, Pennsylvania.

The dispatcher need only dial to obtain operational status of remote, unattended pump station.



Dispatcher receives back via teletype one of three station reports.

Finger-Tip Control . . .

. . . of pipe-line systems

Better operational efficiency is achieved by N.C.R.A. from its improved system of wire-communication control

by Charles Hohnadel*

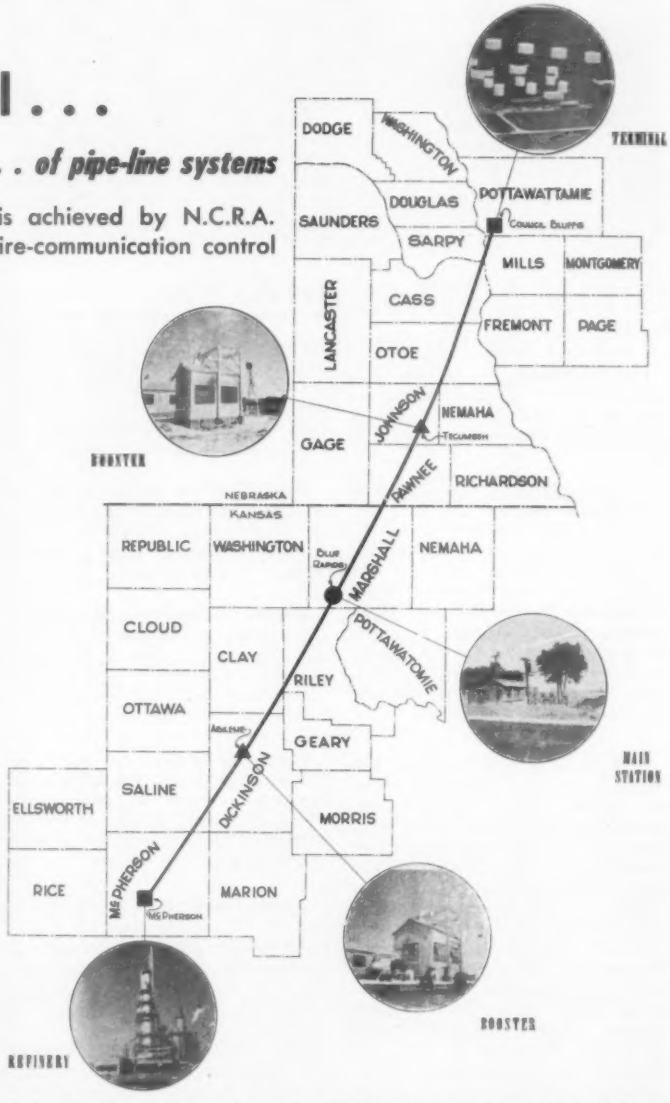
ELECTRONIC equipment, as applied to pipe-line operations today, essentially places at the dispatcher's finger tips the various meters and gages in any part of the system. And that is not all; a given station hundreds of miles away may be shut down or started up by the dispatcher without communicating with anyone at the station.

This new facility is applicable to either large or smaller pipe-line systems, with a net result of improved operational efficiency. Whether the pipeline system is large or small, the basic idea of remote control is carried out generally in one of two ways. These are radio and wire circuits, both of which are highly successful.

Typical of wire-circuit communication for pipe-line remote control of smaller systems is the new installation of National Cooperative Refinery Association, McPherson, Kans. This company, which operates a 23,000-bbl. per day modern refinery at McPherson, uses American Telephone & Telegraph Co. facilities in remotely controlling its products-line operations.

Line layout . . . N.C.R.A.'s 6-in. products line originates at its McPherson refinery and terminates at Council Bluffs, Iowa, 227 miles away. The system, initially equipped with one booster station located at Blue Rapids, Kans. about midway between McPherson and Council Bluffs, recently has been rede-

*Project engineer, Refinery Engineering Co., Tulsa.



Station layout on 227-mile products line from McPherson, Kans., refinery of National Cooperative Refinery Association to its terminal at Council Bluffs, Iowa.

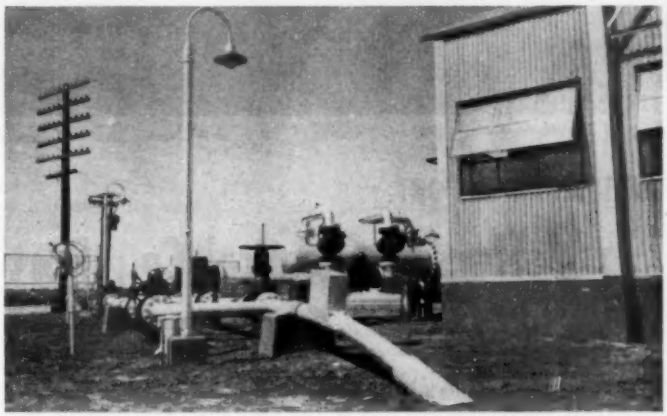
Operational procedure . . . via teletype

TO OBTAIN INFORMATION ON SUCTION PRESSURE, DISCHARGE PRESSURE AND CURRENT CONSUMED BY THE MAIN PUMP MOTOR, THE DISPATCHER DIALS STILL ANOTHER CODE LETTER FOR THE SPECIFIC INFORMATION AND GIVEN STATION. FOR SUCTION PRESSURE HE RECEIVES THE LETTER "S". THIS LETTER WILL BE REPEATED A NUMBER OF TIMES, EACH "S" REPRESENTING AN EQUAL INCREMENT IN PRESSURE IN PSI. UNITS. FOR EXAMPLE, WITH A SINGLE "S" EQUALING 10 PSI., THE SERIES THUS "SSSSSSSSSS" REPRESENTS 100 PSI. SIMILARLY THE LETTER "D" REPRESENTS DISCHARGE PRESSURE AND THE LETTER "A" MAIN MOTOR CURRENT. IN ALL CLASSES THE DATA ARE RECEIVED VIA TELETYPE AT THE DISPATCHERS OFFICE AT MCPHERSON.

signed. The line's capacity has been stepped up in balance with future capacity of the refinery by adding two new booster stations. These new stations, one located at Abilene, Kans., and the other at Tecumseh, Neb., raise the line's capacity to approximately 17,000 bbl. daily. The new station spacing for the over-all system is around 50 miles.

A. T. & T. equipment incorporating teletype control, telemetering, and communications has been installed for controlling the revamped system. Control of the entire system is from the dispatcher's office in McPherson. This office is a prefabricated steel-frame structure, insulated and well lighted. Location of the building is such that the dispatcher has an unobstructed view of the station and surrounding area. Installed in the dispatcher's office are the main teletype control equipment and control panel for McPherson station.

Pumping equipment at McPherson station consists of one 100-hp. and one 200-hp. horizontal centrifugal units. Both of these pumps are powered with electric motors and were installed when the system was originally built.



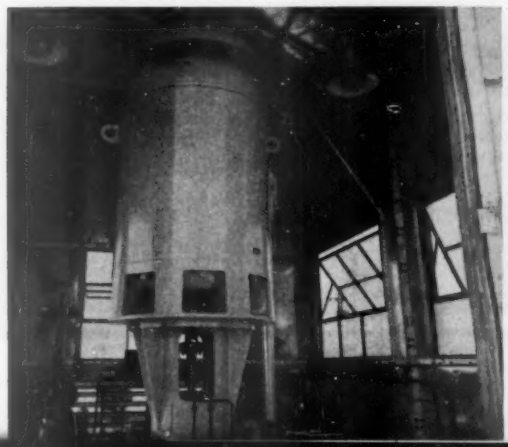
Yard manifold at Abilene station. This is the first booster out of McPherson where N.C.R.A. operates a modern, 23,000-bbl. per day refinery.

The first booster station out of McPherson, the new one at Abilene, consists of two buildings in which control and pumping equipment are housed. Temperature in the control building is maintained at 40° F. minimum, regardless of outside temperature. Both buildings are of the insulated, prefabricated steel-frame type with corrugated-iron siding and roof.

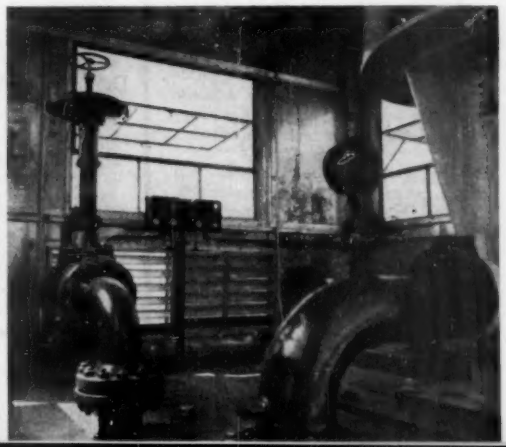
At the Blue Rapids station, the second one out of McPherson, pumping equipment is similar to that at McPherson. Blue Rapids station was built as a part of the original system and served

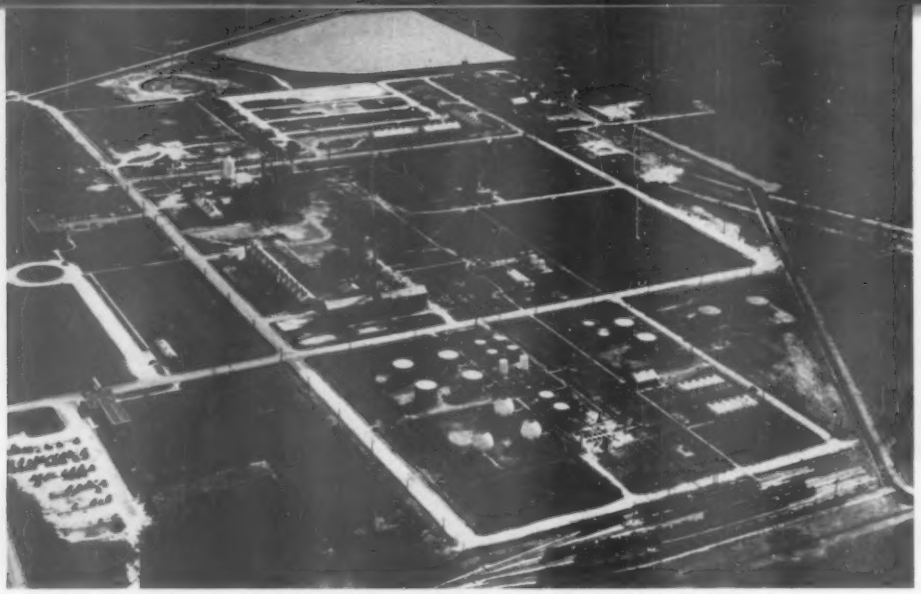
(Continued on page 136)

This vertical, 300-hp. motor powers a vertical, multistage pumping unit.



Control-valve hookup at Abilene. This view shows discharge piping.





AERIAL VIEW of the Neches plant of Jefferson Chemical Co., Inc.

PETROCHEM REPORT:

Jefferson Chemical Co., Port Neches, Tex.

by F. Lawrence Resen
Gulf Coast District Editor

A SORT of round-robin is achieved by the ethanolamines operation at Jefferson Chemical Co., Inc., petrochemical plant at Port Neches, Tex.

Raw refinery gas is received at the plant from The Texas Co.'s nearby Port Arthur refinery. Ethylene recovered from the gas is used as a raw material, along with ammonia, in the production of mono, di, and triethanolamines. And, in the processing of the raw gas in the ethylene unit, one of the end products, diethanolamine, is used to scrub the gas to prepare it as feed stock for the ethanolamine plant.

Such a round-robin effect is achieved on a larger scale throughout the industry, in that not only ethanolamines, but other petrochemical products are used in the petroleum industry to prepare feed stock for further processing in the petrochemical plants.

Ethylene unit . . . The ethylene used in the preparation of ethanolamines, however, is not directly reacted with ammonia, but is first processed to ethylene oxide, which in turn is one of the direct reactants in the ammonolysis step.

The raw refinery gas which reaches the plant consists of both saturated and unsaturated hydrocarbons up to and including C_3's. The incoming gas is put through an ethylene unit, where it is first treated with diethanolamine to remove carbon dioxide and hydrogen sulfide.

This feed stock is then combined with the effluent from the cracking heaters, compressed, and separated in fractionating towers, some of which are operated under low temperatures, requiring extensive refrigeration facilities for cooling and condensing. Propane and ethane are the refrigerants used.

The ethylene unit produces a purified ethylene stream, a distillate high in aro-

Uses of Ethanolamines

MONOETHANOLAMINE

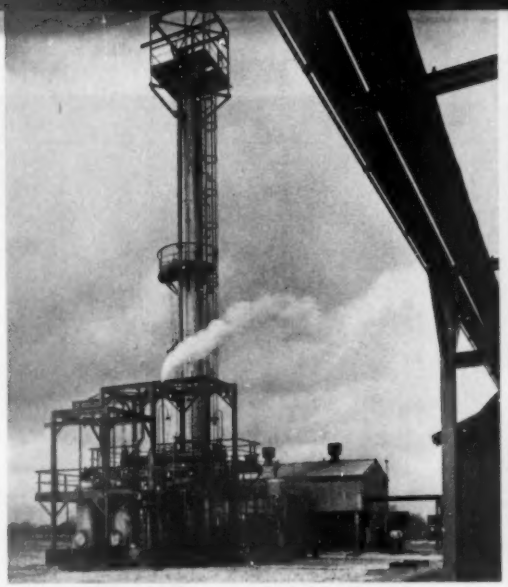
. . . **a gas scrubbing agent for recovery of hydrogen sulfide and carbon dioxide** . . . a chemical intermediate in the manufacture of various surface active agents, rubber chemicals, and other materials . . . an agent in the manufacture of antibiotics.

DIETHANOLAMINE

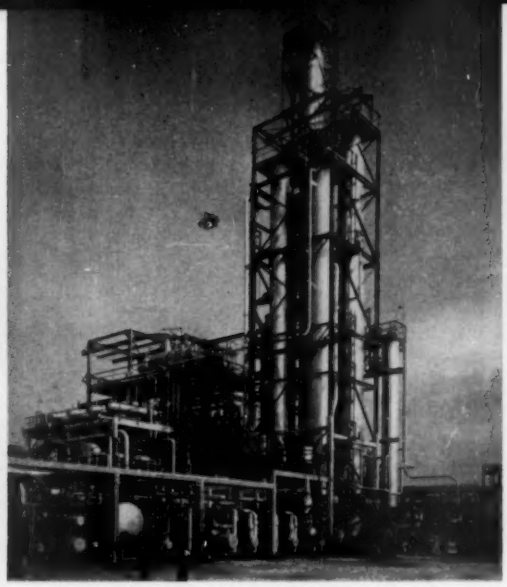
. . . an intermediate in the manufacture of surface active agents used in textile specialties, herbicides, petroleum demulsifiers, etc. . . . **a gas scrubber in refinery operations** . . . a rubber chemicals intermediate.

TRIETHANOLAMINE

. . . an intermediate in manufacture of surface active agents used in textile specialties, waxes and polishes, herbicides, petroleum demulsifiers, toilet goods, cement additives, cutting oils, etc. . . . a rubber chemicals intermediate.



ETHYLENE DICHLORIDE is purified by dehydration and distillation in this unit at the Neches plant.



THE ETHYLENE UNIT is used for production of ethylene, a petrochem building block.

matics, a butadiene stream, and a hydrocarbon polymer stream.

Chlorohydrination . . . The purified ethylene is piped to the ethylene oxide and ethylene glycol unit, which employs the chlorohydrination process. In this process, ethylene is chlorohydrinated to ethylene chlorohydrin, which is treated with lime to give ethylene oxide.

In preparing the chlorohydrin, a tower operating under a pressure of approximately 200 atm. and 20° C. is charged with ethylene. A solution of hydrated lime is introduced until the desired quantity collects at the base of the tower. Compressed ethylene is admitted simultaneously to maintain the desired pressure.

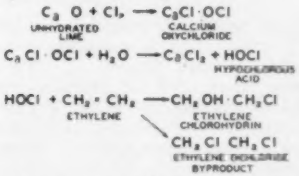
The alkaline solution of ethylene is withdrawn at a constant rate and is then passed into a mixer along with chlorine. The mixer serves to intimately mix the two streams, with the chlorine reacting with the hydrated lime in the mixing chamber to form calcium oxychloride. This immediately decomposes to form hypochlorous acid and calcium chloride.

In the reactor, the hypochlorous acid reacts with ethylene to form ethylene chlorohydrin. The ethylene-chlorohydrin solution is withdrawn from the reactor and further treated.

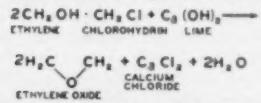
(Continued on page 138)

SNYDER AND HYPERCAL distillation columns are installed in the laboratory building.

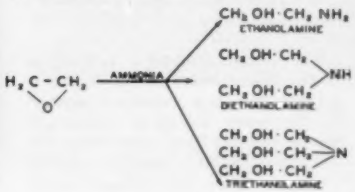
Production of Ethylene Chlorohydrin

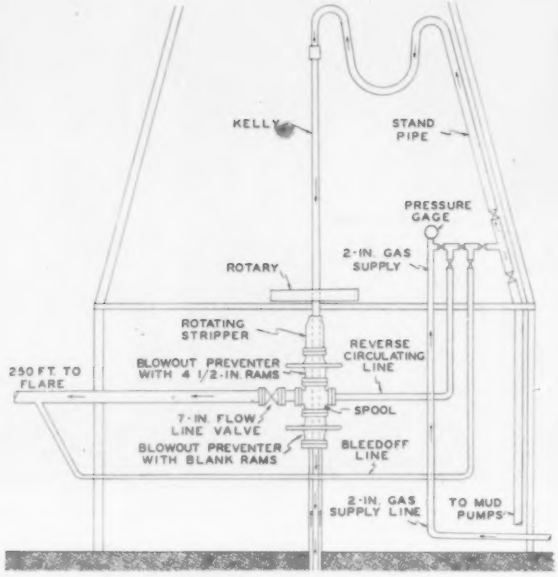


Production of Ethylene Oxide

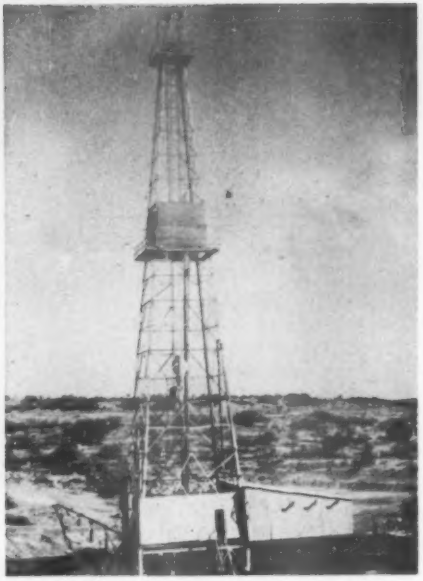


Production of Ethanolamines





RIG HOOKUP and flow system used.



LOCATION, Vinegaronne field, Val Verde County, Texas.

A WEST TEXAS EXPERIMENT

Drilling With Gas Promises Lower Costs . . .

. . . in selected areas, where conditions are favorable

by Earl R. Bruno*

NEW drilling development? . . . Use of natural gas as a medium of removing cuttings. Where? . . . While drilling from 1,510 to 9,531 ft. on the Western Natural Gas Co., R. J. Caraway and Harvey Weir, et al 2 Cauthorn well in Vinegaronne field, Val Verde County, Texas.

Results? . . . This experiment gave almost phenomenal performance, in increased drilling rate, down to a depth of 5,293 ft. At this point 9 bits had been used during 8½ days' total elapsed time as compared to 44 bits and 24½ days on 1 Cauthorn (situated ¾ mile southwest of the 2 Cauthorn and which used drilling mud as a circulation medium).

The above operation is believed to be the first instance in which natural gas was used as a circulation medium for the rotary drilling of a long section of hole. El Paso Natural Gas Co. and other operators have had marked success in the San Juan basin in northern New Mexico by drilling in with natural-gas circulation. The general procedure in this area is to set casing above the producing horizon with conventional rotary methods and then drill into the producing zone with gas, shoot the well, and clean out with gas. This program resulted in great savings in rig time and bits during the drilling-in operations. Also, there have been reports of other operators in West Texas and California who have used compressed air for surface-hole drilling-in operations.

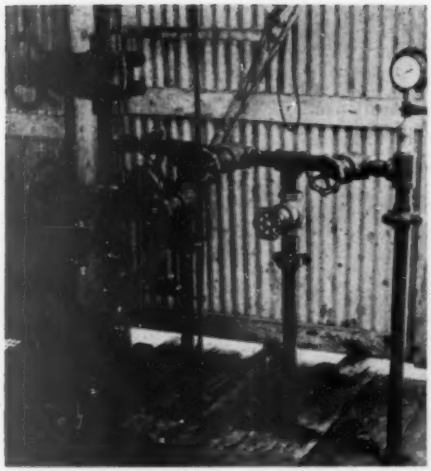
Vinegaronne area . . . The discovery well here was the R. J. Caraway et al 1 Guida Rose which was drilled with conventional mud. The second well in the area was the previously mentioned 1 Cauthorn, also drilled with mud. A total of 192 bits and 116 days were used in drilling the 8¾-in. hole on the 1 Cauthorn to 10,362 ft. During the drilling of this well various types of mud were tried, including oil-emulsion mud, in an attempt to increase the drilling rate, but with no appreciable success. Both of these wells penetrated a long shale section between the surface casing and the producing horizon.

On the 2 Cauthorn well, which was the third well in the area, it was decided to try gas drilling through the long shale section. Conductor casing was set at 450 ft. with cable tools. Surface casing was set at approximately 1,500 ft. with rotary tools using conventional mud.

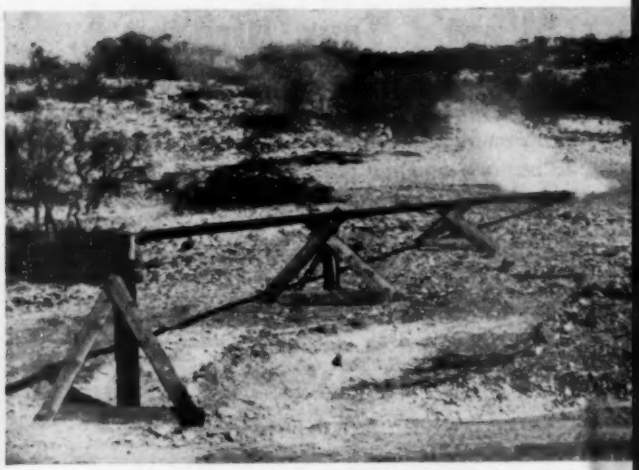
The above casing was necessary to case off any surface water encountered, since the absence of all fluids in the hole is necessary to obtain best results from gas drilling and to eliminate hole trouble. Most of the cuttings in the hole are ground to dust in gas drilling and therefore would create a serious hazard if any fluids were mixed with them.

It was further decided to stop drilling with gas somewhere above the expected

*Division engineer, Western Natural Gas Co.



GAS MANIFOLD, showing inlet gas line, reverse circulating line, bleedoff line and standpipe.



AWAY FROM RIG . . . The 7-in. flow line. The drill cuttings come to surface in dust form.

pay zone and drill into the producing formation with mud since the bottom-hole pressure of the gas-producing zone was expected to be approximately 6,800 psi., which would require a high hydrostatic head for control purposes.

Discussion of Equipment

Surface control equipment consisted of two hydraulically controlled QRC blowout preventers, (one with blank rams, one with 4½-in. rams to close on drill pipe), one hydraulically controlled flow-line valve, a tubing spool with flanged outlets, and a rotating stripper or drilling-in head.

Two hundred fifty feet of 7-in. flow line was used to pipe the gas and cuttings away from the rig where the gas was burned in a flare. A large-diameter flow line was necessary to reduce the high-velocity abrasive action of the gas and cuttings.

Circulation system . . . The flow pattern followed was very similar to drilling with mud. Gas from a nearby source was piped directly into the standpipe: it flowed through the standpipe and drilling hose, into the kelly, and down the drill pipe, and returned to the surface through the annular space, thence out the flow line where it was burned. A pilot flame was kept burning at all times at the end of the flow line. Samples of cuttings were not caught and saved during this operation, but a baffle plate and valve arrangement could have been installed in the 7-in. flow line some 100 ft. from the rig for this purpose.

Special Procedures Used

Prior to making a connection or a trip to change bits, the gas was allowed to flow until the cuttings or dust were cleaned out of the hole and the gas cleared up at the end of the flow line. The gas was then shut off and the bleed-off line was opened. The flame at the end of the 7-in. flow line was allowed to dissipate before the kelly was broken off. The bleedoff line was then left open as a safety factor against pressure that might build up in the kelly through a leaky valve while the kelly was in the rat hole.

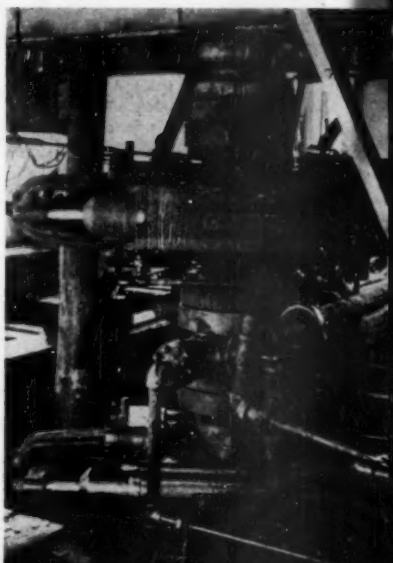
Also, prior to making a trip, the rotating stripper head was removed by clamping it to the top joint of the drill pipe, as the first joint was pulled through the rotary, and laying it down to one side. Only three stripper rubbers were used during the entire 81½ days of gas-drilling operations.

It was not necessary to use the reverse circulating line in the drilling of 2 Cauthorn. In other areas, operators report that reverse circulation of the gas can be used when fishing for junk in the hole or when small amounts of fluid are encountered.

The gas used to drill this well was obtained from the 1 Cauthorn well which had a shut-in pressure of approximately 5,200 psi. The pressures and volumes of gas were controlled by the use of Otis Type J regulators set in 1 Cauthorn, and by Fisher Wizard-type regulators on the surface flow line.

During normal drilling operations the average rate of gas delivery to the drilling rig was 1,000,000 cu. ft. per day at 80 to 100 psig. This included 150,000 cu. ft. per day for the rig fuel necessary to operate the power units of the rig. During the drilling of the well, higher and lower gas volumes and pressures were tried at various depths with no apparent change in the drilling rate. The lowest pressure which was used was 35 psig. with a flow at the rate of 600,000 cu. ft. per day. This variation in rate of flow resulted in the calculated linear velocity of the gas flow up the hole to range from less than

(Continued on page 147)



IN THE CELLAR . . . Showing part of rotating stripper, 10,000 psi. QRC with 4½-in. ram, spool with 7-in. flanged outlets, and 10,000 psi. QRC with blank rams. There also is a 7-in. hydraulically controlled flow line valve.

What's Your "Drilling S. Q."? (Safety Quotient)

Safety is no accident. Safety is the result of hard, intelligently programed work of every man in the organization, from top to bottom, and the results are going to be in exact ratio to the planning and the effort that goes into it.

by Harry H. Hillman*

THE drilling industry since 1945 has constantly striven to increase its efficiency and its unit of productivity, which is a foot of hole. As a result, penetration rates have been increased 56 per cent in the past 6 years.

Industry-wide effort to increase the footage drilled and to speed up operations has necessarily resulted in tremendously increased accident probabilities. Yet, in spite of increased hazards to both men and machines, the over-all accident trend in the drilling industry for the past 6 years has been constantly down.

The American Association of Oilwell Drilling Contractors in 1945 decided to initiate a safety program that would be simple, practical, and effective for the industry. After careful consideration, it was decided that the most effective program should:

1. Include everyone in the contracting firm, from top management to the greenest crew man.
2. Be of use to the smallest and the largest contractors alike.
3. Be effectively operable with or without the services of a safety engineer.
4. Function in such a way that, when coordinated by the association, it could be passed on to the industry and serve as a stimulant to all operators.
5. Coordinate the activities of insurance-company engineers, state inspectors, and all other agencies doing safety work in the industry.
6. Be relatively inexpensive but would pay tremendous dividends in decreased insurance costs.

Small start . . . With the foregoing objectives, in February 1945 the first safety program sponsored by A.A.O.-D.C. was started. Short weekly meetings were started on various rigs under the supervision of the driller, the tool pusher, or, in a few instances, the drilling contractor himself. The reaction from the crews to the first meetings was very favorable, and, almost without exception, each crew man expressed his appreciation to the company for this opportunity to improve safety conditions under which he was working. To the worker, it presented tangible proof of management's interest in his welfare.

Expanded program . . . From this small start, the program has expanded almost industry-wide and now embodies many features not originally contemplated. This has come about through the demands of the drilling contractors, who enthusiastically support the safety program, and with the help of such organizations as the National Safety Council, the U. S. Bureau of Mines, state industrial safety organizations, safety departments of the major oil companies, and safety engineers employed in the drilling industry

The educational committee of the association has always worked very closely with the safety committee because it is axiomatic that, when a man is taught to do a job in the best manner, he will be doing it in the safest manner. Conversely, the safe worker is patently the most efficient and proficient. When this program was started in 1945, only two drilling firms had safety engineers. Now there are about 50 safety engineers working in drilling-contracting firms, doing educational and personnel work along with the safety work.

Excuses for neglect . . . The fact that the association has a very fine and progressive safety program does not mean that all contractors are using it. The attitude among many of the contractors has been that safety work is all right for the major companies, but the drilling contractors are too small, locations are inaccessible, crews are continually changing, the men will not attend safety meetings, the work is inherently dangerous, etc. These certainly are problems, but they should not be used as excuses for neglecting safety work.

Another excuse used for neglecting safety work has been the rather widespread attitude throughout all industry, that it should not be necessary to teach men to do things that they should be perfectly willing to do for their own welfare. Given the best equipment, maintained in excellent condition, a man's safety rests pretty much in his own hands. It is rather a travesty, but men more than any other member of the animal kingdom, must be taught to work safely—many being unable to work safely, naturally or instinctively, as do other animals.

Safety Teaching a Necessity

It is through the bitter experience derived from many years of not teaching men to protect themselves, and the example of thousands of industrial casualties with their attendant financial loss and human suffering, that all industry has come to realize the absolute necessity for teaching men to work safely. Perhaps the most important failing on the part of some of the contractors may be expressed as a lack of constant interest. Reports from safety engineers, insurance companies, and state accident commissions show that the universal complaint is "that management is often as hard to sell as is the workman." The employe interest in safety will be only as active and last as long as the drilling contractor's interest. The slightest indication that the men at the top regard safety work as a fad or a fetish will almost immediately be reflected in a lack of interest on the part of the workman coupled with a consequent increase in accidents. The contractor with a consistently poor safety record will invariably have a low morale among his men, and, as we all know, the oil-field grapevine is a very efficient system for news dissemination. Once the contractor has established a reputation as an unsafe operator, the reputation spreads and is almost impossible to live down.

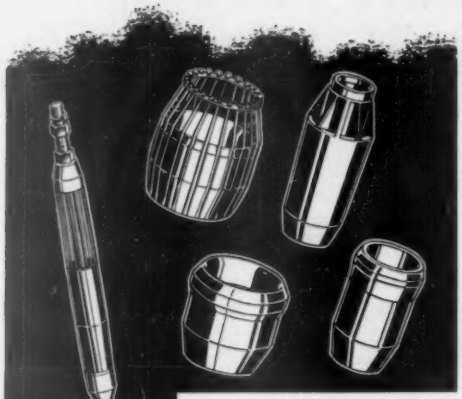
Safety-program essentials . . . A good safety program is as essential to a drilling contractor as a rig and a string of drill pipe. The U. S. Bureau of Mines recently pointed out that in all industry, companies with no safety programs have 24 times as many accidents as companies who do have safety programs.

There are two essentials to a good safety program. The first is that we must keep records if we want to see results—records which will show us that we have had accidents and what they cost us. They will also, after a while, give us a picture of what our safety program is doing.

The other essential to a good safety program is proper and immediate ac-

*President of California Production Service, Inc., Long Beach, Calif., and vice president of American Association of Oilwell Drilling Contractors. From paper presented at 1952 annual meeting of Society of Exploration Geophysicists.

Do you have a Swabbing Problem?



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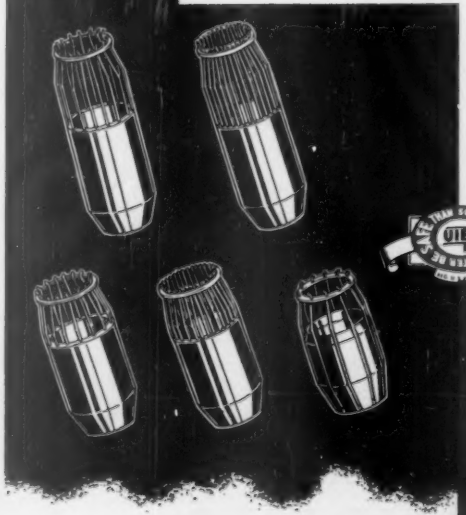

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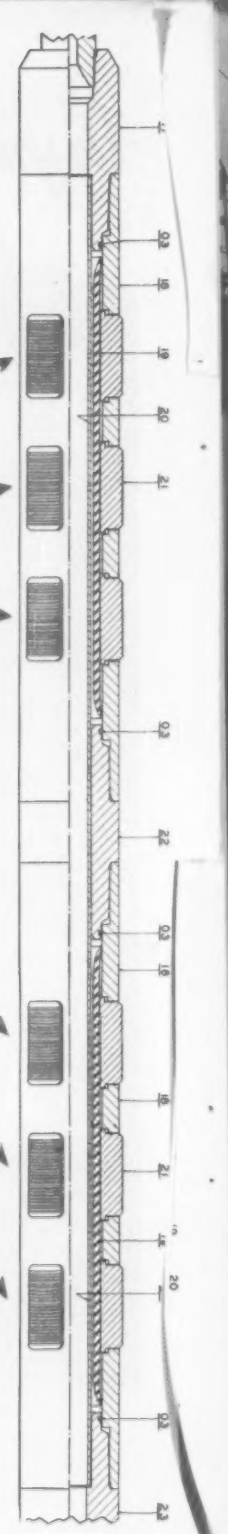
NO WEDGING OF THESE SLIPS



The Eighteen slips of the Wilson Hydraulic Pulling Tool *do not* travel on a tapered cone or mandrel. They are actuated by pump pressure and travel straight out to wall of the casing.

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Remember . . . with the Wilson Hydraulic Pulling Tool there are no "J" Slots; you do not have to rotate; and it is virtually impossible to stick this tool in the hole because of slip action.

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03 – "O" Ring
18 – Body
19 – Element
20 – Inner Sleeve
21 – Slips
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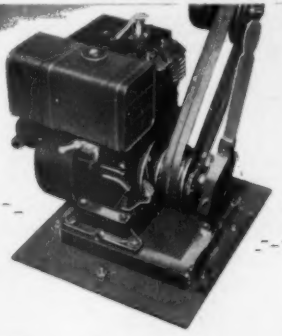

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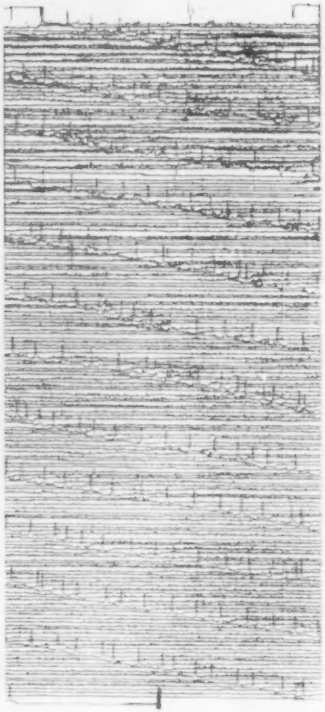

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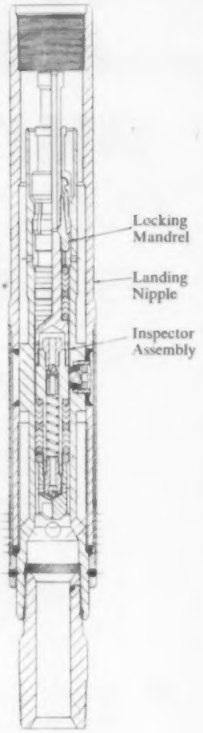

4

Fig. 1—Individual feeler-arm springs in mechanical tubing caliper. Fig. 2—Original metal chart as plotted by tubing caliper. Fig. 3—Caliper log on a severely corroded tubing string. Fig. 4—Downhole chemical injector.

These Tools Ferret Out Corrosion

If you would fight corrosion, you must first know of its presence. Here are some valuable aids in determining where and how severe it is.

by Kenneth W. Robbins* and Warner M. Kelly*

SEVERE corrosion damage has been discovered in gas-condensate wells, high-pressure wells producing pipe-line oil, and in low-pressure wells producing oil and various amounts of salt water. Corrosion damage appears to be more rapid and severe in wells on gas lift.

Inspection made early in the life of a field result in equipping wells so that corrosion control is facilitated, and corrosion losses will be reduced. Caliper surveys allow rapid and accurate determinations to supplement other field data.

*Otis Pressure Controls, Inc.

Corrosion control . . . The available measures to control subsurface corrosion are as follows:

1. The injection of chemicals for conditioning the corrosive fluid.

2. The use of corrosion-resistant alloys, either for components or as platings and linings.

3. Nonmetallic coatings or lining materials may be used.

4. Cathodic protection may be developed to a point suitable for protection of tubing and casing.

5. A program should be set up to check continually all equipment exposed to corrosive environment.

Detection of Corrosion

Several methods have been employed to determine the presence of corrosion. The most common practices are: (1) Coupon tests, surface and subsurface; (2) water samples; (3) carbon dioxide; (4) visual inspection; and (5) internal caliper surveys.

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Coupon tests . . . The coupon test is a method commonly used to predict corrosive characteristics of a producing well. The customary procedure is to place the coupon at some point in the christmas tree or flow line of the well, and measure weight loss after a certain period of exposure. Coupon tests give a fairly good indication of the rate of corrosion at the particular location of the coupon. Coupon tests are not desirable in many oil wells due to paraffin deposition.

Iron content . . . Another fairly reliable indication of the severity of corrosion damage is the analysis of the iron content of the water produced. However, care must be exercised in obtaining a representative sample, and the iron content varies considerably with the amount of water produced. Iron concentration is very difficult to determine in wells making pipe line oil due to insignificant amounts of water produced. Correlation of corrosion rate and iron content has been very poor in wells making large amounts of water.

Carbon dioxide content . . . Carbon dioxide content of the gas, and organic acid content, is another method of anticipating corrosion damage.

Visual inspection . . . Visual inspection of surface connections will indicate the degree of corrosiveness of the producing well. It is a simple matter to examine all fittings downstream from the master valve. Inspection of all fittings downstream from the tubing hanger is also common practice in several high-pressure fields.

Bottom-hole regulators are installed to plug the tubing string and all surface connections are relieved of pressure. The entire christmas tree is removed, and can be completely disassembled, for careful visual inspection. This type of inspection is made periodically by some operators.

However, it has not yet been possible to correlate corrosion damage in surface connections with corrosion damage in the tubing string. Tubing strings have been found to be in good condition in some wells in which the surface connections were severely pitted. On the other hand, there have been inspections made in several wells and surface connections were found to be in good condition, while the tubing joints were severely corroded.

Caliper surveys . . . The best method of determining the location and extent of corrosion damage in any given well at any particular time is the use of the internal caliper.

The two types of internal calipers in common use are the electrical and mechanical types.

"Best method for corrosion detection is use of internal caliper."

The electrical instruments are run on a large conductor-type steel line and the use of these instruments is limited to wells having little or no surface pressures.

The mechanical-type calipers are adapted to be run into tubing on a steel measuring line, using the same equipment as required to run subsurface controls. Surface pressures have no direct bearing on the use and operation of the mechanical type caliper. The weight of the casing caliper instruments and fluids in which the instruments are run necessitate the use of a larger line.

The feeler head includes a retraction device which permits lowering the caliper into a well with all the feeler arms retracted (Fig. 1). When the caliper has reached the desired depth the feeler arms are released by proper manipulation of the instrument.

Calipering is accomplished by means of a group of independently operating lever arms, to the outer end of which are attached 3/16-in. tungsten carbide balls to contact the tubing wall. Each lever arm is provided with an individual coil spring to urge the feelers outwardly against the tubing or casing wall.

The inner arms of the lever contact the upper end of the stylus rod so that the stylus is driven downward whenever any one or all of the feelers move outwardly into a pit. In the event that there are several pits of varying depths about a single cross-section of the tubing, the stylus will be actuated by the one feeler arm corresponding to the deepest penetration of the tubing wall and the stylus will be lifted free of the other arms. The caliper shows the minimum wall thickness at any point traversed, rather than the average wall thickness at any one point.

Chart drive . . . To provide maximum footage per run, the stylus holder is mounted on a lead screw which is, in effect, a part of the stylus rod. The lead screw moves axially only to record the depth of penetration. The stylus holder is rotated down the lead screw by means of a drive assembly. Therefore, if there were no arm movement, as in a very smooth section of tubing, the stylus point would follow a helical path and the resulting chart would be a series of parallel straight lines.

When the feeler arms are moving into and out of corrosion pits, this motion is added to the helical motion of the stylus point and the resulting chart is a series of wavy lines which are a true profile of the tubing interior (except for the fact that the caliper records the deepest pit at any instance).

The drive assembly provides the rotary motion for the stylus assembly. Spring-loaded loading wheels keep the drive wheel firmly against the tubing and also aid in keeping the caliper centered within the tubing bore. As the drive wheel rotates, it acts through a worm gear and a train of spur gears to rotate the stylus around the lead screw.

When the lowest point to be calipered has been reached, the instrument is pulled out of the hole at a rate not to exceed 100 ft. per minute.

Assuming a perfectly smooth-walled tube, the motion of the stylus assembly would cause the stylus to scribe a spiral line upon the chart material, corresponding in pitch to the pitch of the thread on the lead screw. Upon removing the chart for inspection, this spiral would be seen as a series of parallel lines on the chart.

Any pits in the tubing wall, however, will cause vertical motion of the stylus, and so produce deviations from the straight and parallel nature of these lines. The magnitude of these deviations may be read directly as the depth of the deepest pit at that particular point.

The caliper is entirely free of packing glands. The full well pressure is freely admitted to all parts of the caliper mechanism, including the chart chamber. The chart chamber is filled with oil for lubrication and the coating on the chart permits the logging of the condition of the tubing in the presence of these fluids.

The elimination of packing glands, with their inherent frictional lag, permits the stylus to follow more closely the motions of the feeler arms, in order to provide a more accurate record of small variations in the interior configuration of the wall.

Also, there is no danger of collapse of the outer wall of the instrument, for pressure loading does not occur. The caliper can be run safely under any pressure for which the stuffing box and lubricator are safe.

Interpretation Chart

As soon as the caliper is pulled from the well it is disassembled and the metal chart is removed. The metal chart represents the condition of the tubing and a brief field interpretation is made on the well location. A complete interpretation is possible in the field, but the normal procedure is to process the charts in a central office by personnel who are specialists in caliper-chart interpretation.

Fig. 2, an actual photograph of the metal chart obtained by the Otis tubing

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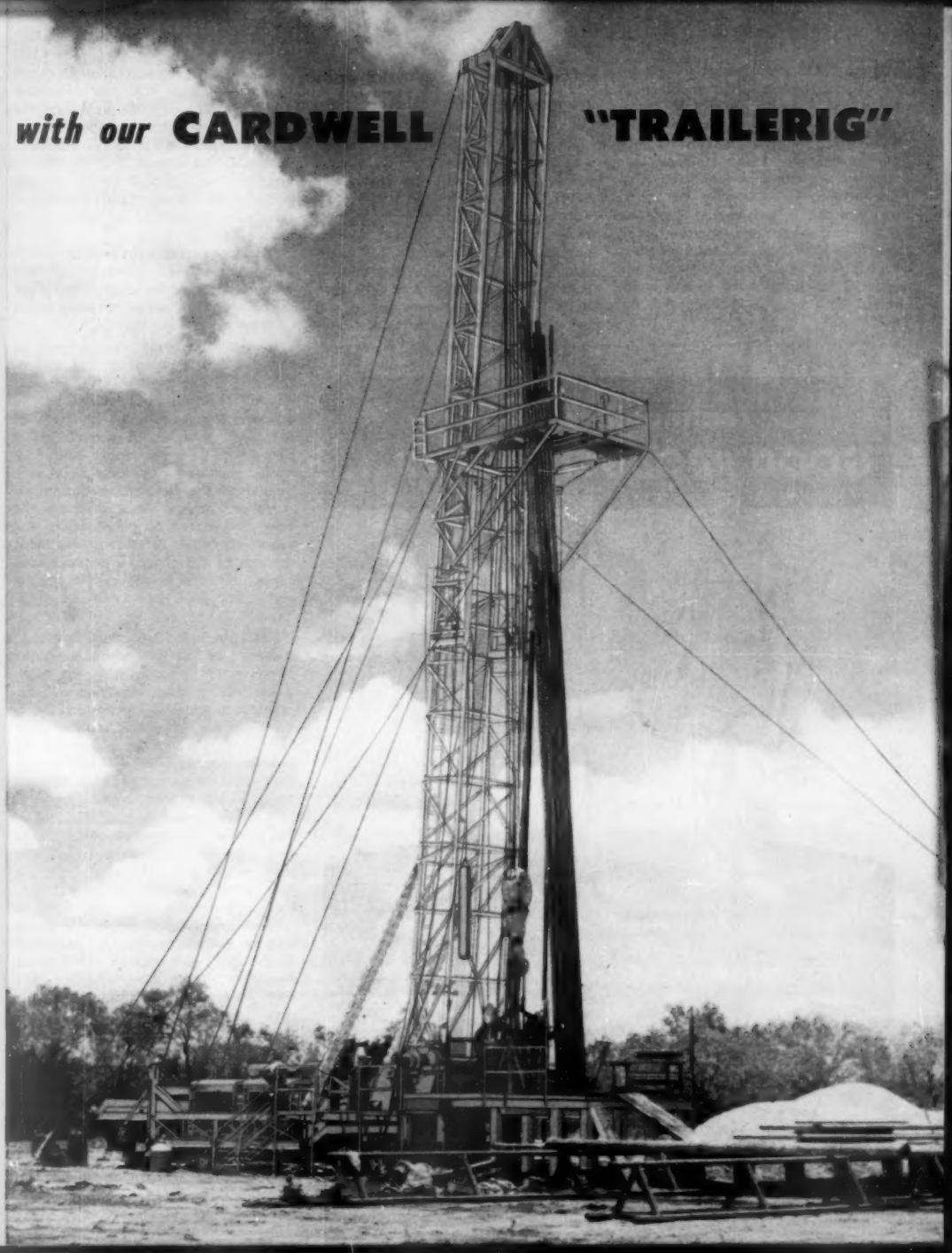

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caliper. The metal chart is photostated and the photostats included in the caliper reports are actual reproductions of the chart obtained in the well. After the metal chart has been photostated the tubing couplings are assigned a number as numbered from the surface. In numbering the tubing joints on the caliper charts, a number is not assigned to pup joints or special couplings found in the tubing string. This is done in an effort to enable the operator to locate any specific joint when the tubing is pulled from the well.

Location of corrosion pits may be determined.

Referring to a caliper chart of a well with very little corrosion damage, it will be observed that the chart lines are relatively straight and parallel, except, of course, at the tubing couplings where the feeler arms expand to their maximum limit of travel.

In order to determine the internal diameter of the tubing, it is customary to set the maximum expansion of the feelers to a predetermined value slightly less than the internal diameter of the tubing couplings. With the instrument set in this manner, the peaks on the log at the collars represent a known diameter, and by a simple measurement and calculation it is possible to establish the internal radius at any point in the tubing string. Thereby, a reference dimension is recorded at each collar.

The interpretation of caliper charts showing corrosion pits can be best understood from the study of a caliper log on a severely corroded tubing string as recorded in Fig. 3.

The distance between the lines on the chart corresponds to a change in radius of the tubing of 0.05 in. Hence, any pit that allows the chart line to advance to the adjacent line is 0.05 in. deep, or if to the second line it would be 0.10 in. deep, etc. This simple relationship permits rapid estimation in the field of the extent of corrosion damage. As a final step, the chart is enlarged by photostating, and more accurate measurements made throughout the chart. The photostatic copies included in the caliper reports are double enlargements of the metal charts.

After the individual joints have been scanned, the pits are tabulated in the interpretation. Along with the tabulation the general condition of the tubing is noted and special mention is made of any abnormal conditions in the tubing. Also, the percentage of loss in wall thickness is included on the right-hand margin of the photostatic copies in the caliper report.

Variation in the internal diameter of one joint of tubing with respect to the next joint may be determined. If one joint is slightly undersized and the next joint is slightly oversized, then the corresponding chart lines will be very close together. These two joints may be within the tolerances allowed at the mill, even though the internal diameters vary. This condition has been observed in several caliper surveys in the past and subsequent caliper surveys of the same wells have verified this variation of internal diameter. Variation of the internal diameter of casing is more frequent than in the surveys of tubing.

Mashed tubing or crooked tubing will be recorded on the caliper chart as the same type of chart line deflections. If the tubing is mashed or crooked the caliper will be forced to one side of the pipe and consequently the feeler arms are pressed inward on that side and permitted to move outward on the other side of the caliper. Thus the chart line deflection will result as a well-rounded chart line deflection as

(Continued on page 143)

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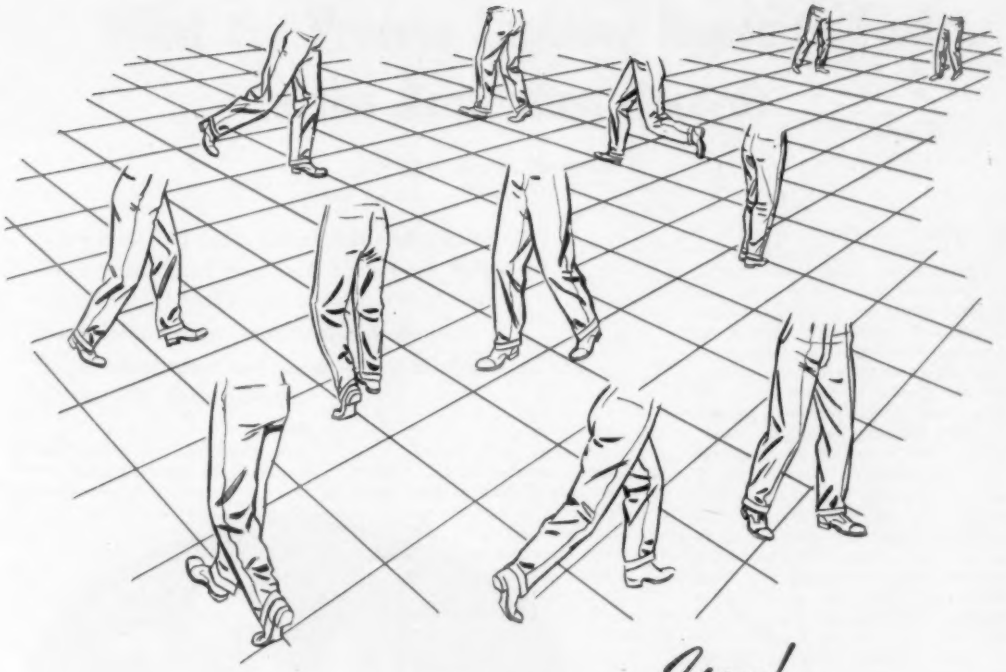

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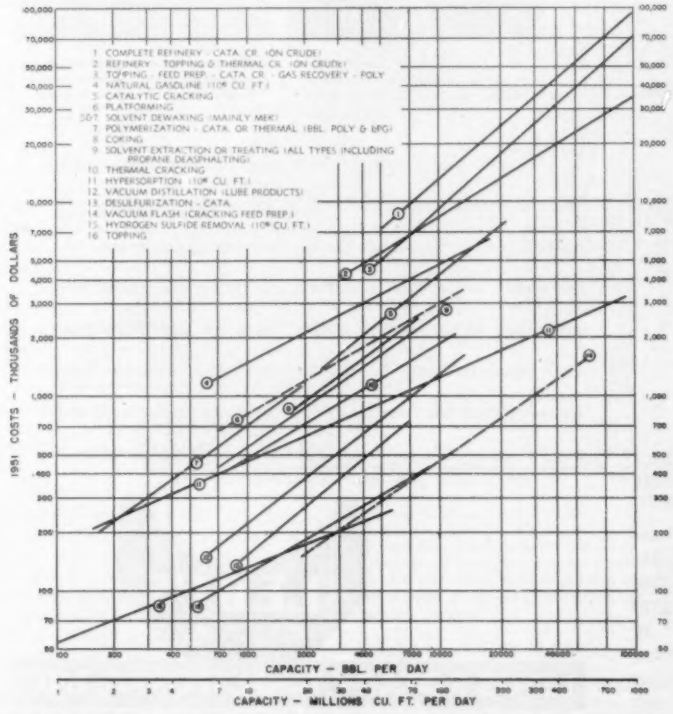
What the Process Engineer Hopes to Find In the Accounting Records

by W. L. Nelson
Technical Editor

- More detailed costs rather than total costs.
- More records of hours of each kind of labor; quantities of materials, utilities, oil stocks.
- More information on qualities of utilities.
- Close association between the operating and the accounting departments.

ENGINEERS are sometimes stunned by the enormous detail that accountants are able to master in keeping the cost record of even a small refinery. Perhaps some executives are also secretly appalled when confronted with detailed accounting records. The fact remains, however, that both engineers and executives are utterly and completely dependent upon cost records in charting the operation and maintenance of a refinery. Thus, cost figures constitute a firm foundation by which engineers can confidently plan future installations and can undertake changes in existing equipments or operations; and by which management can enthusiastically plan, regulate, finance, and market. Not least, management can, from this foundation, face the mysterious investigations of some agents of our Government.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5&7. SOLVENT DEWAXING (MAINLY MEK)
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16. TOPPING
1951 COSTS - THOUSANDS OF DOLLARS
CAPACITY - BBL. PER DAY
CAPACITY - MILLIONS CU. FT. PER DAY

Fig. 1—Indication of cost (1951) of complete refineries or plant units as a function of capacity.

Actually, accountants, engineers, and management are a triple-threat team of efficiency experts. Accounting records point up or sound the alarm that certain operations are highly effective, or perhaps more often, that troubles have arisen. Thereupon, engineers or operators can set about to determine the exact technical reasons for the change; and management can explore matters of labor, personnel problems, effects on the market, or the expansion or curtailment of the operation.

Too frequently accounting records are looked upon simply as a record of past performance. This is, of course, a necessary and valuable function, but from the standpoint of the engineer, these records are useful in another and different way, namely, as a means of projecting present operations into the future. Stated in another way, accounting records are in themselves statistical, but they also contain the seed of operations not yet in existence. Although the chemist or engineer can formulate new operations, or the rank business promotor can have his dreams or hopes, in the end the cold facts of costs must be respected.

Decisions Regarding Operations

The plant or process engineer is constantly faced with decisions regarding the economy of:

1. Changing the operating procedure of the various refinery plants or units.

2. Changing the capacities of various units or the capacity of the entire refinery.

3. Producing new products or altering the relative amounts of the various products.

Mere altering of the operating conditions of temperature, pressure pumping rates, etc., without materially altering or adding to the processing equipment, can accomplish within limits, the changes enumerated above. It is obvious that detailed costs of labor, heat, power, maintenance, etc., must be available for each of the processing units if the economy is to be judged. As only one illustration, the need of a higher-octane-number gasoline encouraged one refiner to consider the use of a higher temperature in the cracking unit. However, such a high temperature causes the length of run to be only about 90

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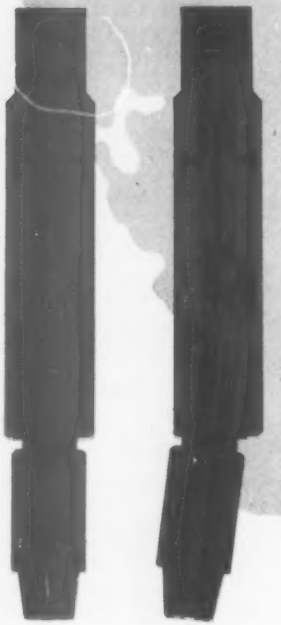

Photograph of LeBus Knuckle Joint in straight position between Bowen Bumper Sub and Bowen Overshot.

Photograph of LeBus Knuckle Joint in Knuckled position between Bowen Bumper Sub and Bowen Overshot.

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days rather than the customary 105 days. Examination of the accounting records showed at once that the cost of the extra shutdowns or turnarounds and the cost of additional fuel for the higher operating temperature would be greater than the value of the improvement in octane number.

Although many changes of the nature of 1, 2, and 3 above, can be accomplished without additions of equipment, the engineer is also confronted with more profound changes such as:

4. Reassembling of existing towers, vessels, pipe lines, pumps, etc., so that the old equipment can be used more effectively or so that a new or more modern process can be conducted.

5. Major enlargements in capacity.

6. The adoption of a new process, either as an addition to the existing plant or as a replacement that will suddenly reduce the value of one of the units to that of junk.

7. Undertaking major repairs or replacements rather than the building of a completely new unit.

8. Altering existing processes or equipments during each shutdown, so that the types of processing conducted in the plant do not become obsolete or so that the most modern equipments or corrosion-resistant materials can be adopted at the earliest possible date.

The layman frequently fails to understand that modern or up-to-date processing does not always require a new plant or a new refinery, that new processes can often be conducted in old equipment merely by the establishment of new operating conditions and new pumping rates, and by a reconnecting of the piping system or the relocation of control instruments. Thus, the plant operations are in a constant state of flux by which the plant is being continuously modernized, the amounts of products are being changed to meet the current requirements of the market, the product quality is being improved or changed, and the possibility of installing new plants or processes looms over all. It may be necessary or useful to process a new or different crude oil, or at least to accommodate any small productions of local crude oils.

Still another ever-present source of argument or trouble to the process engineer is the determination of the potential worth or value of materials that are not sold directly but are further processed into several or into alternate products. Cracking-still gas is an illustration of such a material. It consists of several hydrocarbons that can be converted or separated into various products by chemical processes. The easiest thing to do is to burn the gas as

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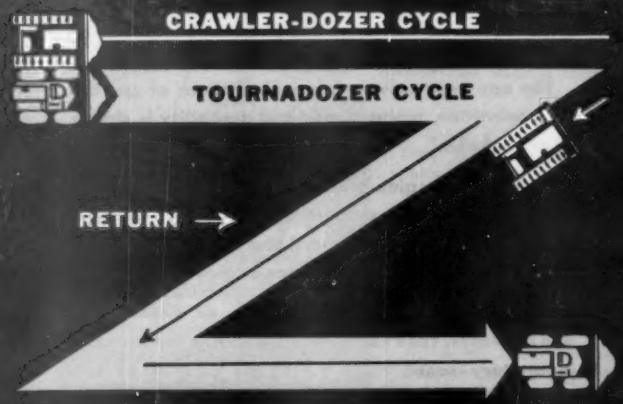

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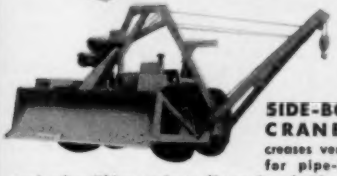

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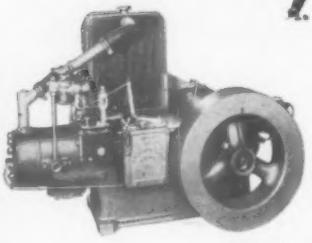

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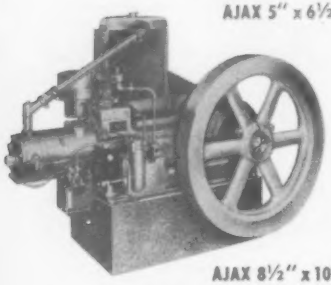

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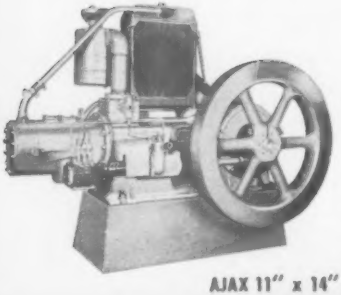

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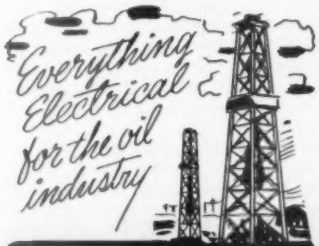

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a fuel, but its value is greatly enhanced if it is processed further.

The following tabulation indicates the values of the products that can be obtained from one cracking still gas (1945 prices) when processed in different ways:

(a) 19.6 cents per M.c.f.—Used as plant fuel.

(b) 29.9 cents per M.c.f.—Recovering 14-lb. natural gasoline by absorption, and burning the remaining gas.

(c) 39.1 cents per M.c.f.—Recovering a BB-cut, (isobutylene, butadiene, etc.), and burning the remaining gas.

(d) 59.5 cents per M.c.f.—Recovering BB-cut, polymerizing propylene into motor fuel, recovering the ethylene part of the gas, and burning the remaining gas.

Even other processing schemes can be employed such as complete polymerization, alkylation, or the separation of liquefied petroleum gases. However, these most inviting product values involve the costs of installing increasingly elaborate gas-recovery systems or chemical plants, and the costs of operating them. This is mentioned for the specific purpose of indicating that utility, labor, and construction costs must be available in great detail if the engineer and management are to be able to decide wisely among the many alternative ways that a material can be utilized or ways that capital can be invested.

Labor and Utility Costs Needed

Consideration of these needs indicates at once that labor and utility costs are the types of cost figures that are most needed for projection into future operations. It is presumed that equipment and material costs are necessary evils and that their magnitude can be determined with sufficient accuracy by means of average figures or by quotations from manufacturers. Furthermore, many executives attach little significance to equipment costs provided they are reasonably accurate, because (1) little or nothing can be done about them without altering the process, and (2) because capital investment usually contributes a somewhat minor amount (10-20 per cent) to the final cost of refinery products. Thus, for two sizes of plants, the percentage costs are some as shown in the table.

Although it is customary for engineers, managers, etc., to look for payout times of 1-3 years, no such payout is expected in complete manufacturing installations. The fear of million-dollar investments is mainly an affliction of the lower management supervisors, accountants, or engineers, whereas top management often welcomes large investments provided only that the pro-

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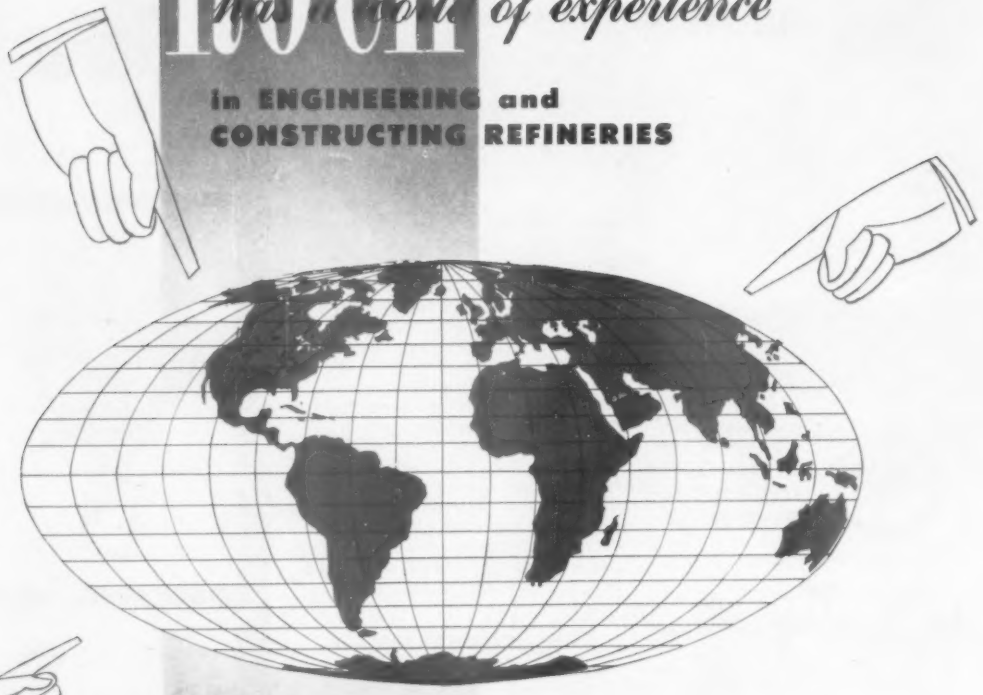
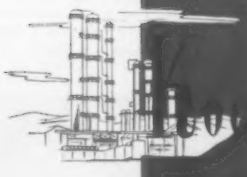


From West Texas to India, and from Canada to South Africa, Koch has earned a reputation for engineering and constructing refineries. Koch combines top-flight engineering talent with practical refinery experience to provide the most flexible unit for a minimum investment.

You have a standing invitation to "call on Koch" to discuss your next refinery project.



KOCH ENGINEERING COMPANY, INC.

MANUFACTURERS • BUILDERS

DOUGLAS • WICHITA 2, KANSAS

A. F. CRAIG & CO., LTD., PAISLEY, SCOTLAND

	Cracking plants		Topping and cracking	
	Small	Large	Small	Large
Fuel	26.0	31.0	23.0	33.0
Labor	19.5	16.0	20.0	14.0
Depreciation	17.0	14.0	12.0	10.5
Chemicals and TEL	9.5	10.5	9.5	12.5
Supervision	1.5	0.5	15.0	5.5
Maintenance	9.0	9.0	8.0	9.0
Steam and power	7.0	7.5	6.5	8.0
Royalty	5.5	6.0	3.0	4.0
Water	5.0	5.5	3.0	3.5

posed venture will earn a satisfactory return on the investment.

In most instances the cost of equipment can be estimated with sufficient accuracy by unit costs such as those published in the Cost-imating series which appeared in The Oil and Gas Journal during 1948 and 1949 (available in reprint form). Approximate costs of over 200 types of equipment were stated in the Cost-imating series, and cost indexes are available whereby these 1946 equipment costs can be kept currently to date (first weekly issues of the months of January, April, July, and October). In addition, the Nelson Refinery Construction Cost Index is published in the first issue each month.

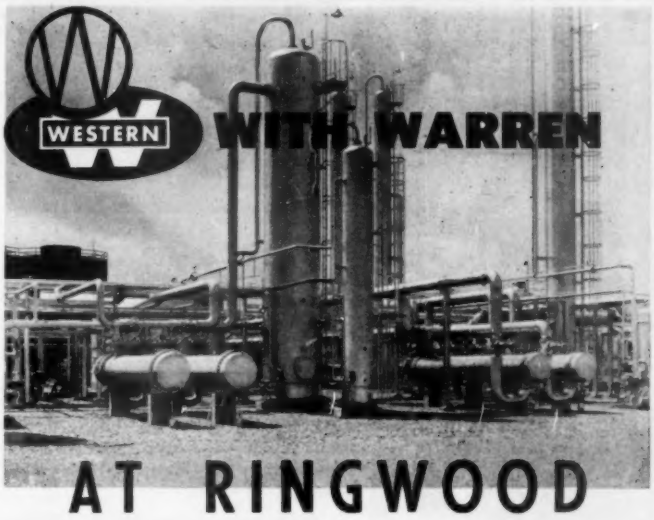
Such equipment costs are not precise but they are adequate for most of the decisions that must be made by management or engineers. Obviously, it would be better to obtain the unit cost of equipment from the accounting records of the refinery rather than from average costs, but a complete line of such costs is seldom available from the records of a single refinery because some purchases are made at infrequent intervals and because some items of equipment may never have been purchased.

Fig. 1, from the same source (Cost-imating series) indicates the total installed costs of more complete assemblies of equipment such as process units, plants, or even complete refineries. Such costs are obviously approximate but they are helpful to management in deciding whether or not it is even worth while to expend funds for market surveys, for the obtainment of quotations from contractors, or for plant research. In many instances, a proposed installation may be dismissed at once by learning from Fig. 1 or similar data, the magnitude of the capital investment. The chart also provides a means of comparing various possible methods of operation.

Thus far it has been established that engineers are most interested in detailed cost information that will permit them to judge the costs of equipment or operations that are not yet in existence. Such projected operations or installations will never be exactly the same as the operations currently being conducted. The cost of new equipment can be estimated with reasonable accuracy from tabulations such as those used by cost estimators, or in the extreme by obtaining quotations from manufacturers, but the costs of repair materials and techniques are unique to each refinery, and these must be obtained from accounting records. Nor is the engineer primarily interested in the over-all or total costs of operation of already existing or operating equipment.

Cost Needs of Engineering and Management

What remains after the aforementioned types of costs are eliminated (new-equipment costs and over-all operating costs) are those costs that are somewhat peculiar to the functioning or practices of each organization or each refinery. They include such activities as maintenance, minor construction, repairs, and shutdowns; and if sufficient detail is available in the accounting records, the engineer can ar-



The Warren Plant

Process capacity — 50,000,000 cu. ft. of gas per day.
Pipeline gas yield — 40,000,000 cu. ft. per day.
Natural gasoline yield — 32,000 gal. per day.
Butane yield — 24,000 gal. per day.
Propane yield — 24,000 gal. per day.

Meeting the obstacles of water shortage . . . relatively lean gas . . . and a widespread gathering area, the engineers of Warren Petroleum and Oklahoma Natural Gas Company successfully designed, built and opened the new Ringwood Gasoline Plant.
Western Supply Company congratulates these men on their ingenuity in solving these difficult design problems. We are proud to be a part of the Ringwood Plant through the Western-designed heat transfer equipment shown above.

VALVES & FITTINGS FOR RINGWOOD SUPPLIED FROM WESTERN'S WAREHOUSE STOCKS OF . . .
NORDSTROM VALVES
TAYLOR FITTINGS AND FLANGES
CHAPMAN VALVES
CRANE VALVES

TEMA
WESTERN HEAT EXCHANGERS
Manufactured by
WESTERN SUPPLY COMPANY
P.O. BOX 1888 TULSA, OKLAHOMA

The Klemp Metal Grating Corporation has been serving the needs of the Oil Companies for almost half a Century. During this time Klemp has produced and patented several specialized gratings such as Hexteel and Floorsteel for ganister linings in the Refining Division of the Oil Industry.

Klemp Welded Steel and Diamond Riveted Grating are consistently specified for stair treads, walkways, landings, tower stairs, catwalks, stairways and many other applications to insure—

- *Fireproof Non-Slip Footing for Men and Traffic.*
- *Efficiency with Safety.*
- *Protection Plus Comfort Through Complete Ventilation.*

For 45 years the Klemp Metal Grating Corporation's engineers have specialized in the fabrication of gratings and open steel meshes only. This specialized experience is at your service. Factories are centrally located in Chicago and Houston.

We solicit the opportunity to solve your most difficult flooring problems. Send in your blue prints for quotations today.

All types of Klemp Open Steel Gratings are available for immediate shipment.

KLEMP
METAL GRATING CORPORATION
Executive offices: 1501 No. Branch St., Chicago 22, Illinois
Plant: 6601 So. Melvina Ave., Chicago 38, Illinois

rive at unit costs for each such activity.

The concept of unit cost is easily illustrated by utility costs which are almost universally stated as cents per thousand pounds of steam (or per million B.t.u.), cents per million B.t.u. of fuel, cents per thousand gallons of water, etc., or by wage rates which are obviously unit costs. However, with respect to maintenance, construction, repairs, shutdowns, etc., the concept of unit costs is not as clear, mainly because no two shutdowns or no two maintenance jobs are exactly alike. Accordingly, the obtainment of such unit costs should probably be assembled as needed by collaboration between the accounting and engineering departments rather than be carried as a regular part of accounting records. With regard to this and other detailed figures that will be mentioned later, it might be useful to keep an astute process engineer in the accounting department or keep an equally astute accountant in the process engineering department. Such unit costs (maintenance, turnarounds, etc) could probably be best handled by a job or work-order system of accounting. Included in each job would be the hours of each kind of labor including supervision; the amount, unit, and total costs of each material or supply; the rental of any services or equipment; the amounts, unit costs, and total costs of any utilities that are consumed; and a depreciation or rental item on any plant or shop tools, or machinery, that have been employed during the job.

In summary, the following types of detailed information are most useful:

1. Direct labor costs for:

(a) Each process operation (wage rates and times of operators and supervisors).

(b) Each utility or general service departments (wage rate and time of each distinctive type of labor).

(c) Each maintenance or repair job (wage rates and times of unskilled, trade and supervisory labor).

(d) Each part of a construction job (wage rates and times of common, trade and supervisory workmen).

2. Amounts and cost of chemical or process materials used in each process or service operation such as topping, cracking, treating, leading, water treating, etc., (amounts and unit costs). Among such items are: tetraethyl lead, caustic, lubricating oils, greases, inhibitors, dyes, etc.

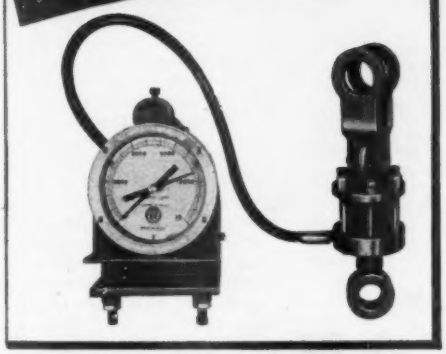
3. Utility costs for each process operation (amount and unit cost), for each service department or operation such as water treating, water circulation, storage, product transfer, etc., and for

Here's What One Major Oil Company Accomplished

Saved $18,450 and Reduced Fishing Time 77%*

(in one year)

Drill Collar Service Increased by Controlling Tong Torque with the MARTIN-DECKER TONG TORQUE GAUGE



*Economy of Controlled Torque

(Obtained by a major oil company)

The operating days and footage drilled with four classifications of drill collars. The first period reflects operating data for a year prior to field application of the tong torque indicator and the second period represents a year following utilization of the indicator. The days and footage drilled by the four classifications of collars are comparable; yet the total time spent in fishing for drill collars has been reduced from 712 hours in the first period to 220 hours in the second. This results in a saving of 492 hours, or approximately $18,450, in rig time, based on a rig expense of $900 per day.

The Martin-Decker Tong Torque Indicator was not solely responsible for this saving; however, this instrument contributed greatly to these results since follow-up on drill collar failures shows that the practice of overtonging and running loose joints has been greatly reduced.

The Martin-Decker Tong Torque Gauge removes the two basic causes of drill collar failures—overtonging and loose joints. OVERTONGING results in pulled and distorted threads. RUNNNING COLLARS TOO LOOSE allows the joints to work, resulting in cracks and washouts.

The Martin-Decker Tong Torque Gauge is simple in construction and design, consisting of a hydraulic unit attached to a gauge by means of high-pressure hose. A pre-set hand on the gauge shows where the torque is high enough or how much has been pulled, as desired. The gauge is in direct line of the driller's vision.

Check These Outstanding Features

- Prevents drill collar failures.
- Ideal for checking automatic cathead pull.
- Makes possible precise pull regardless of operating variables.
- On and off the tong handle in seconds.
- Highly portable, rugged and dependable.
- Weighs less than 25 lbs.
- One torque gauge adaptable to all tong handles.

Write for descriptive literature

	SIZE											
	7¾"			6"			5¼"			4¾" or Less		
PERIOD	Footage	Days	Fishing	Footage	Days	Fishing	Footage	Days	Fishing	Footage	Days	Fishing
1st	115,720	492	206¼	183,420	1682	505¼	18,343	453	0	5,355	73	0
2nd	100,178	404	51¾	216,114	1647	117¾	36,852	797	39½	12,968	222	11

HOME OF THE WEIGHT INDICATOR

MARTIN DECKER CORP.

LONG BEACH, CALIFORNIA

SAN JOAQUIN VALLEY: T. J. CULLEN, BAKERSFIELD, CALIFORNIA
MID-CONTINENT DISTRIBUTOR: REED ROLLER BIT COMPANY, HOUSTON, TEXAS
CANADIAN DISTRIBUTOR: REED ROLLER BIT COMPANY OF CANADA, LTD., CALGARY & EDMONTON, ALBERTA

HERE'S THE JACK YOU NEED
FOR ALL OIL FIELD LIFTING
AND LOWERING JOBS!
Pear-shaped ring permits greater adaptability in pulling poles, stumps, beams, etc.
In claw lifting, the ball and socket design of the head and claw assures greatest support area and protects against the load shifting.
1523

DUFF-NORTON

No. 1523 All-purpose OIL FIELD JACK

This is the ultimate in versatility for oil field jacking service. With its swivel base permitting full 15-ton capacity at any angle, the No. 1523 Jack was designed for four types of service: (1) *straight lifting* with the load applied to the head . . . (2) *chain lifting* . . . (3) *claw lifting* . . . and (4) *foot lifting* of low height loads with the integral foot lift. Ruggedly built for long service, this dependable jack is safe and easy to operate under all conditions.

WRITE FOR BULLETIN AD-19U.

THE DUFF-NORTON MANUFACTURING CO.

Main Plant and General Offices: PITTSBURGH 30, Pa.—Canadian Plant: TORONTO 6, ONT.

"The House that Jacks Built"

each maintenance, repair or construction job.

(a) Fuels (amount, heating value, and unit cost).

(b) Powers (amount and unit price or cost).

(c) Steams, live or high-pressure (amount and unit cost).

(d) Steams, exhaust or used (amount and unit value).

(e) Water—fresh (amount and unit cost).

(f) Water — circulated (amount and unit cost).

(g) Air-power (amount and unit cost).

4. Direct total costs of each process operation, service operation, service department, etc., as well as the amounts of material processed or handled in each operation or department.

5. Over-all costs of a less direct nature that are probably already a part of all accounting records, such as:

(a) Labor burden — housing, hospitals, retirement, savings, etc.

(b) Plant and company overheads.

(c) Taxes and insurance.

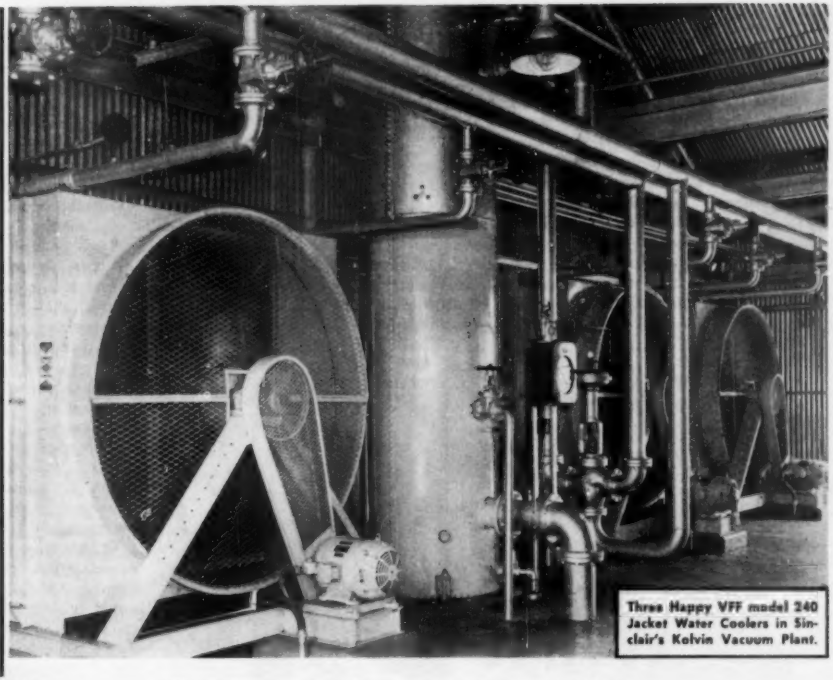
(d) Depreciation,* replacement, or obsolescence.

Undoubtedly, this simple listing is not entirely complete but it should indicate that once the engineer has detail labor times (and costs), and the costs of materials or supplies, equipments, and the amounts of utilities (and unit costs) for each process operation, each repair or maintenance job, each construction job, each service department or operation, etc., he can assemble or compute not only the operating or total costs of each existing operation but can finally assemble or estimate the total costs of entirely new operations. Although figures for estimating the cost of equipment are already available to engineers in such publications as Cost-imating (The Oil and Gas Journal, 1948-1949), similar unit costs of operation, labor or repair, etc., are not ordinarily available to him.

Perhaps such detail as that indicated

*In the face of the inflation of the last 20 years and the somewhat rapid changes in construction costs, it would seem advisable to develop some means of writing off the effects of inflation as a part of the current cost of operation. One means of doing this would be to base depreciation charges not upon the initial capital investment but upon the current economic value of the plant. Thus, depreciation can be looked upon somewhat as a current economic charge. The amount of insurance should also be based upon current values. Replacement values, or current economic values, can be estimated from the Nelson Refinery Construction (Cost) Index or other indexes published in quarterly issues of Cost-imating in The Oil and Gas Journal. These would, of course, have to be corrected for depreciation already allowed over the years and the remaining value would be depreciated over the remaining years of useful life of the equipment.

YOU CAN'T BEAT



Three Happy VFF model 240 Jacket Water Coolers in Sinclair's Kelvin Vacuum Plant.

HAPPY COOLERS
. . . for Low Cost, Efficient Cooling

The know-how of more than 33 years oil field experience has gone into these coolers. They've been proven in the field.

In addition to normally lower *first* costs, Happy Master Line Coolers give you lower installation costs and lower maintenance costs.

So we say again, you can't beat HAPPY Coolers for Low Cost, Efficient Cooling. To solve your cooling problems call or write any one of our field representatives or Cooler Engineering Department, Tulsa. Phone 2-2191.

SERVING FOR. . .

BWH Industrial Hose
Happy Coolers
Rubber Belting
Leather Belting
Bull Dog V-Belts
Sure-Grip Sheaves
P & H Engine Starters
Safety Switches
Happy Pumping Units
Power Transmission Equipment

The HAPPY COMPANY
Formerly HAPPY BELTING COMPANY
TULSA, OKLAHOMA

33 HAPPY YEARS

BRANCH STORES:
Seminole ..... Oklahoma
Salem ..... Illinois
Odessa ..... Texas
Ellinwood ..... Kansas

DISTRICT REPRESENTATIVES:
Dallas ..... Texas
Kilgore ..... Texas
Pampa ..... Texas
Wichita Falls ..... Texas
Wichita ..... Kansas

herein is too expensive to be carried as a regular part of accounting records, but it might be possible to obtain one type of information during a 1 or 2-year period and then turn to another type of information during the next 2 years. In this way a backlog of situations or cases could be established as a guide in making estimates. After all, labor times, supervisory times, consumptions of utilities, etc., for specific jobs will remain somewhat constant for several years, and if current wage rates, utility costs, etc., are available, the total costs of many jobs can be brought up to date, with reasonable accuracy. Regardless of whether or not such costs are carried on the books, in the end the engineer must have them or their equivalent. All too frequently such costs are obtained by estimates based on altogether too scant information.

Summary

If anything new has been suggested herein, it is probably the need of:

1. More detailed costs rather than total costs.

2. More records of the **hours** of each kind of labor, **quantities** of materials, **quantities** of utilities, and even the **quantities** of oil stocks being processed.

3. More information for answering questions regarding the **qualities** of utilities such as:

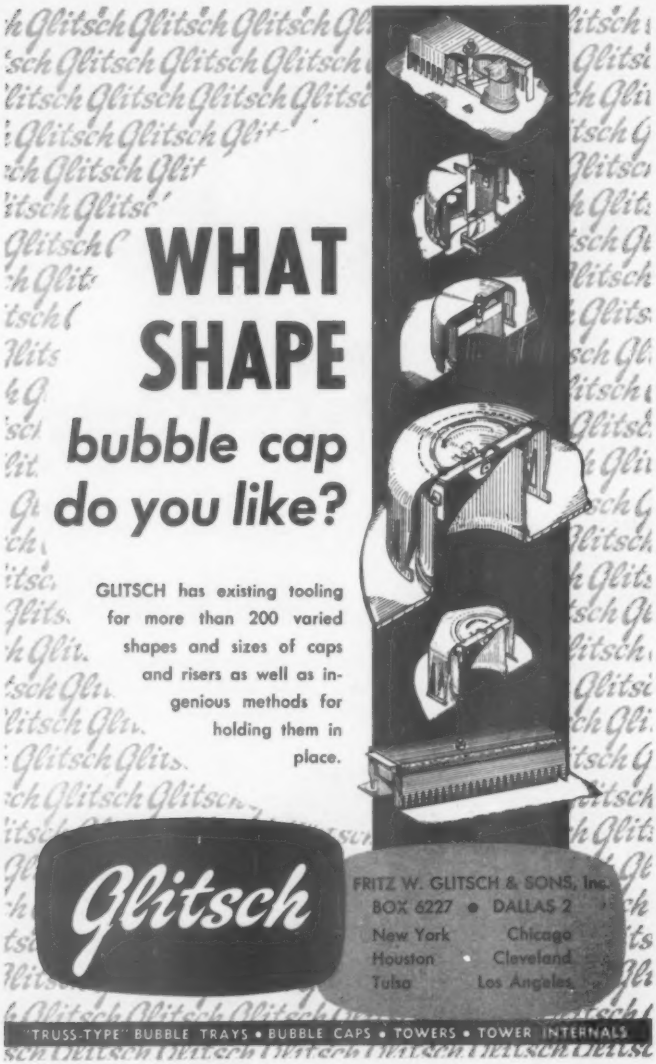
(a) Is the fuel purchased; is it plant gas; or is it a product offered for sale?

(b) Is the steam obtained directly from the boiler; is it superheated; is it exhaust steam?

4. An even closer association between the operating and the accounting departments.

It is also implied that the totaling of costs in many different ways or combinations may not be necessary. Of course, such grand totals as the costs of operating certain units or the total cost of the entire refinery operation are necessary, but many other totals may be omitted until such times as generalized information may be needed for a specific study.

The primary reason for the need of greater detail is the fact that the engineer or management is only partly interested in statistical records of past performance. His real need is a means of visualizing and judging operations or conditions that are not yet in existence. Thus, he needs unit costs of labor, utilities, and chemicals, and even the "unit costs" of various parts of complete installations, specific activities or manipulations, etc., so that these can be combined in the proportions required by a new or proposed operation. Engineers do obtain, although often by estimate, all of the costs and figures called for herein, and since accountants know much more about some of these items than do engineers, it seems obvious that such information can be made more reliable and perhaps can be obtained at a lower cost, if they are obtained as a joint engineering-accounting function.


WHAT SHAPE bubble cap do you like?
GLITSCH has existing tooling for more than 200 varied shapes and sizes of caps and risers as well as ingenious methods for holding them in place.
Glitsch
FRITZ W. GLITSCH & SONS, Inc.
BOX 6227 • DALLAS 2
New York Chicago
Houston • Cleveland
Tulsa Los Angeles
"TRUSS-TYPE" BUBBLE TRAYS • BUBBLE CAPS • TOWERS • TOWER INTERNALS

Finger-Tip Control

(Continued from page 101)

as the only booster on the line until the two new stations were installed.

Tecumseh, the third and last booster station in the system, is set up similarly to Abilene station, since it is also a new one. Main pumping equipment for these two new boosters are Byron Jackson, Hydropress units. These vertical 20-stage units are driven with 300-hp. electric motors.

Communications Setup

To start up any of the four stations in the system the dispatcher operates a dial similar to the ordinary telephone dial. Likewise he can shut down a station or obtain suction pressure, discharge pressure, and electrical load at any of the three boosters or terminal stations.

When a station is shut down by the

dispatcher it may be restarted at will via remote control. However, if the station is automatically shut down because of excessive bearing temperature, electrical failure, or other local trouble, it cannot be restarted remotely by the dispatcher. To place the station back in service in such case the cause of the shutdown which results in a permanent lockout must be corrected on the job.

System operation . . . When the dispatcher at McPherson control station dials the code letter to start up a given station, the signal initiates a number of operations at the station. First, the circuit controlling the motor-operated suction valve is energized opening the valve which had been in a closed position during the period the station was shut down. When the suction valve is completely open, a relay then closes the pump-motor circuit to complete the next operation. Soon after the pump motor has reached full speed, the discharge valve is opened, completing the final step in the sequence of starting operations.

By dialing still another code letter a sequence of operations are started which will shut down a station. However, these operations are not carried out in exact reverse order of the starting sequence. First the pump-motor circuit is opened, then both suction and discharge valves are closed. This leaves the station temporarily locked out and it may be started again as desired by the dispatcher.

Interlocks in the control system prevent erroneous operations. For example where conditions call for both permanent and temporary lockouts, only the permanent lockout contact closes.

Station information . . . Request for operational status of any station may be obtained by the dispatcher as desired. By dialing the proper code letters he receives one of three replies via teletype. These are:

1. Normal.
2. Temporarily locked out.
3. Permanently locked out.

To obtain information on suction pressure, discharge pressure and current consumed by the main pump motor, the dispatcher dials still another code letter for the specific information and given station. For suction pressure he will receive the letter "S." This letter will be repeated a number of times, each "S" representing an equal increment in pressure in psi. units. As for example, where a single "S" equal 10 psi., the series "SSSSSSSSS" would represent 100 psi. Similarly, the letter "D" represents discharge pressure and the letter "A" main motor current. In all classes the data are received via teletype at the dispatcher's office at McPherson.

"Operational status obtained by dialing proper code letter."

Only 45 seconds elapse from the time the dispatcher dials a station for operational data until the report is completed. The sequence for reporting the data is first, suction pressure; then, discharge pressure, and last, amperage. On completion of the telemetered information, the station's code letter is automatically transmitted to end the report and then the circuit opens, clearing the line for use at other stations.

How it works . . . Several steps are involved in telemetering station information to the dispatcher. First, an electrical impulse, set up by the dispatcher's dial, keys in a sensing and selector relay at the station. Next, the selector makes contact with the first of three transmitters for a period of 15 seconds, then moves on to the next transmitter and after 15 seconds at that position, it moves on to the last transmitter. After 15 seconds at this

RED DEVIL

SLUSH PUMP VALVES

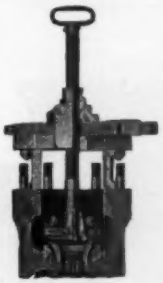
For high pressure abrasive service

In the manufacture of Red Devil Valves, particular emphasis has been given to HIGH PRESSURE ABRASIVE SERVICE at lowest possible operating costs. Their design is unique in simplicity, having only 5 parts. Valve and Seat are drop forged for maximum strength and processed for a deep high-carbon case to withstand excessive abrasive action. Seat has the least possible flow restriction and flat surface on bottom provides easy removal with Valve Seat Puller. "DIA-TEX" Inserts are Oil and Heat Resistant and can be reversed when worn on one side to double their long service life.

Write for Catalog No. P-110.

SPRING LOCK WASHER | VALVE INSERT PLATE | REVERSIBLE "DIA-TEX" VALVE INSERT | VALVE | VALVE SEAT

RED DEVIL VALVE SEAT PULLER



Provides a fast and positive means for pulling badly stuck valve seats by gripping the bottom rim of the seat. Eliminates the expense and hazards of removing seats with a cutting torch. All parts are made of highest grade alloy steel. Write for Catalog No. P-111.

CONSULT YOUR COMPOSITE. For full information on Red Devil Valves, Pullers and other Products, see Composite Catalog or write for price catalogs noted above. Red Devil Products are available through your supply store.

OIL WELL MANUFACTURING CORP.

6002 South Alameda St., Los Angeles 1, California

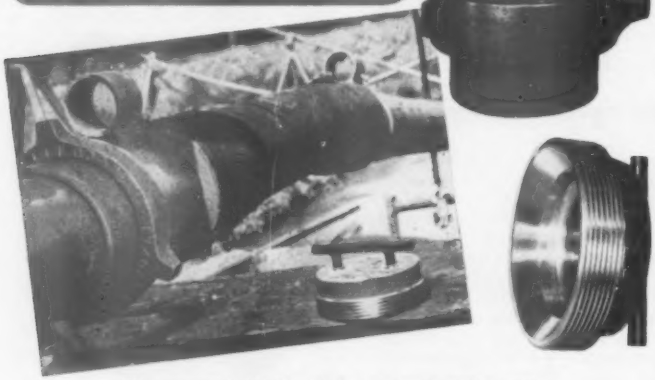
TOOLPUSHER
"For fast pump hook-up, we haven't found anything that beats the WECO Fig. 400 suction union."

DRILLER
"Compounding the pumps is a quick, easy job since we've been using the WECO Fig. 400 for pump suction connection."

PURCHASING AGENT
"Those tough, durable WECO Fig. 400's give us a lot more service without trouble. And in my language, that's saving money."

DRILLING ENGINEER
"We've standardized on WECO Fig. 400 for pump suction connections, because we never have to match suction hose to pump."

WE GO FOR WECO FIG. 400 SUCTION UNION



When you use WECO Fig. 400 for your pump suction connection, the female blanking plug at right can replace the female sub on suction line and blank it for compounding the pumps.

The vibration and pulsation constantly present in a pump suction connection are a real test of sealing ability for any union. The WECO FIG. 400 is a master of this situation, plus the convenience of serving as a blanking plug when compounding pumps.

Rugged acme wing nut threads make-up quickly and a few hammer blows seal the union perfectly. For compounding, blanking plug replaces the female sub. The change-over takes but a few minutes.

The WECO FIG. 400 Suction Union not only provides a fast, simple pump suction connection, but also saves the cost and time of installing blinds or valves in the line for compounding.

Ask your WECO Representative about the Fig. 400 for your pump suction connections.

SOLD EXCLUSIVELY THROUGH SUPPLY STORES

It's Wise to Standardize with... WECO ...

WELL EQUIPMENT MFG. CORP.
Division of Chiksan Company
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Manufacturers and Distributors of Oilfield, Refining, Marine and Industrial Equipment

last position, the selector contact is returned to its original position, transmits its code letter and is then ready for another operation.

In addition to control and telemetering functions, the A. T. & T. facilities are used for communications between station operators and dispatcher. The various station operators "talk" with each other and with the dispatcher via conventional teletype equipment installed at McPherson and at the other stations.

The remote-control system and enlargement of the products-line system were worked out by engineers of Refinery Engineering Co., Tulsa, and L. N. Young, pipe-line superintendent for National Cooperative Refinery Association.

Jefferson Chemical Co.

(Continued from page 103)

Ethylene oxide . . . Under elevated temperatures, the ethylene chlorohydrin solution is treated with lime to form ethylene oxide. This product is also used as an intermediate in the production of ethylene glycol formed by hydrolysis of the oxide.

In the chlorohydrination process, crude ethylene dichloride is produced as a byproduct along with a mixture of higher chlorinated hydrocarbons. A separate unit is used to purify the dichloride by drying and distillation.

Finally, the ethanolamines are produced by the reaction of ethylene oxide with aqueous ammonia. The crude products are separated into the various end products of mono, di, and triethanolamine by successive distillation.

New plans . . . Recently, Jefferson announced plans to produce ethylene oxide and ethylene glycol by a different process—that being the direct oxidation of ethylene. The facilities would consist of an additional feed gas line from The Texas Co. refinery, an ethylene cracking and fractionating unit, an ethylene oxide unit, and an ethylene glycol unit. Additional steam-generating, water-treating, and water-cooling equipment, as well as additional storage, would be part of the expansion.

New units nearing completion are the nonyl phenol and dinonyl phenol installations. These will be the first Jefferson products not dependent upon refinery gas as initial raw material.

Nonyl phenol is produced by the alkylation of phenol with propylene polymer in the presence of a suitable catalyst. Further steps in purification beyond the initial distillation yield dinonyl phenol. The two phenols are used in nonionic detergents and as

Billion dollar blowout

It happened at Hull, Texas, in 1922. A young contractor by the name of *Jim Abercrombie* was re-working a well when it blew out and caught fire. As he watched his hard-won equipment being destroyed, he resolved to do something about this menace that had begun to stalk the struggling young oil industry. Soon, from his newly acquired "repair shop" . . . *Cameron Iron Works* . . . came the first crude model of a ram-type blowout preventer. This was the grand-daddy of the now famous pressure-operated Cameron Blowout Preventers which have become a byword in the oil fields. Their savings to the industry are already inestimable . . . *perhaps a billion dollars or more* . . . considering the valuable reservoir pressures, costly well bores and machinery and the conservation of tremendous quantities of oil and gas. So, an event which might have passed as just another blowout in the roaring twenties actually sparked the development of the Cameron line of drilling and completion control equipment that is now regarded as the standard of comparison the world over.

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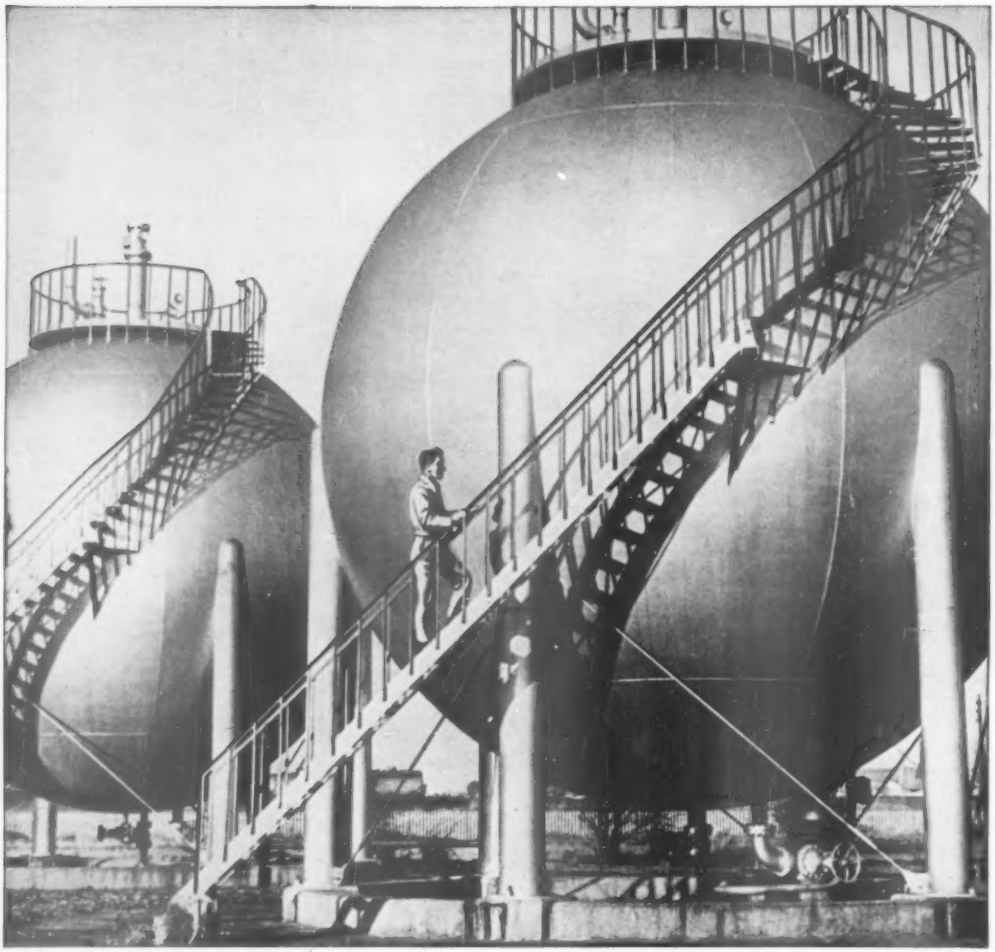

GLOBAL OPERATIONS . . .

Symbolic of Anglo-Iranian's global operations are these Hortonspheres in the Company's refinery at Grangemouth, Scotland. By 1953 the throughput of Anglo-Iranian's four refineries in the United Kingdom will be over 200,000 barrels a day—a valuable contribution to the country's increasing refining capacity. In Australia, plans are going ahead for the construction of the largest refinery in that continent. Throughout their existing overseas refineries, Anglo-Iranian and its associated companies are rapidly increasing throughput to meet the world's demand for petroleum products.

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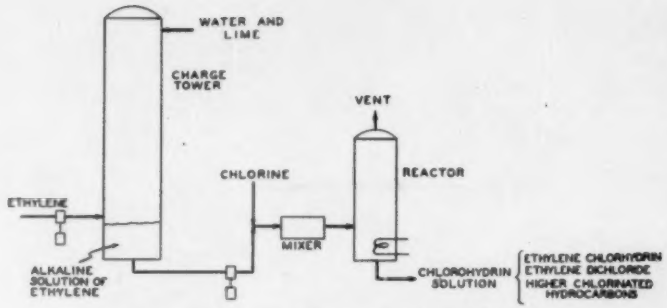

FLOW CHART for the preparation of ethylene chlorohydrin.

starting materials for lubricating-oil additives.

Plant background . . . During the latter part of 1944, The Texas Co. and American Cyanamid Co. planned the formation, under joint ownership, of Jefferson Chemical Co., Inc.

The 1,100-acre plant site was selected near Port Neches, Jefferson County, Texas, and construction of the first plant was begun in 1946. The first tank car of product was shipped in February 1948.

The plant site is located about 5 miles from The Texas Co. refinery at Port Arthur from which charge gas is piped to the chemical plant.

Plant products include: aromatic distillate, diethylene glycol, ethylene dichloride, ethylene glycol, ethylene oxide, polyethylene glycol, polyglycol, polychlorinated ethers, monoethanolamine, diethanolamine, triethanolamine, nonyl phenol, and dinonyl phenol.

Plant personnel . . . L. R. Strawn is plant manager of Jefferson Chemicals Co., Inc.; M. H. Holmes is assistant plant manager. Other key personnel are: B. A. Davis, production superintendent; N. A. Agapetus, process engineer; C. H. Moore, plant engineer (mechanical and maintenance); J. L. Parker, personnel manager, and W. E. Meents, plant accountant.

What's Your "Drilling S. Q."?

(Continued from page 109)

engineer, or buy a safety program, and presto—no more accidents. This is as fallacious as the notion that accidents are bound to happen and there's nothing to do about it. Prevention of accidents is a direct operating function, and the administration of the safety program must be done by operating personnel.

Responsibility . . . The safety engineer, the safety program, and the various safety services that are available are not alone the answer to prevention of accidents. They are of very great assistance and should not be underrated, but it is the operating man who is solely and unequivocally responsible for success or failure. The accident-prevention problem of the contractor and that of any one of his drillers are identical, with one exception. This single exception is the degree of responsibility. The driller is responsible for his crew during his tour; the contractor is responsible for the safety of all of his crews all of the time.

As an example, let us think of a con-

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The high-pressure dehydration unit here illustrated is a property of the United Gas Pipe Line Company at Carthage, Texas. It represents the most advanced design, construction, and operating technique; and the drying agent employed is FLORITE DESICCANT. The Stone & Webster Engineering Corporation, who designed and constructed the plant, are users of FLORITE in various types of equipment, large and small, for oil and gas companies and for other branches of industry.

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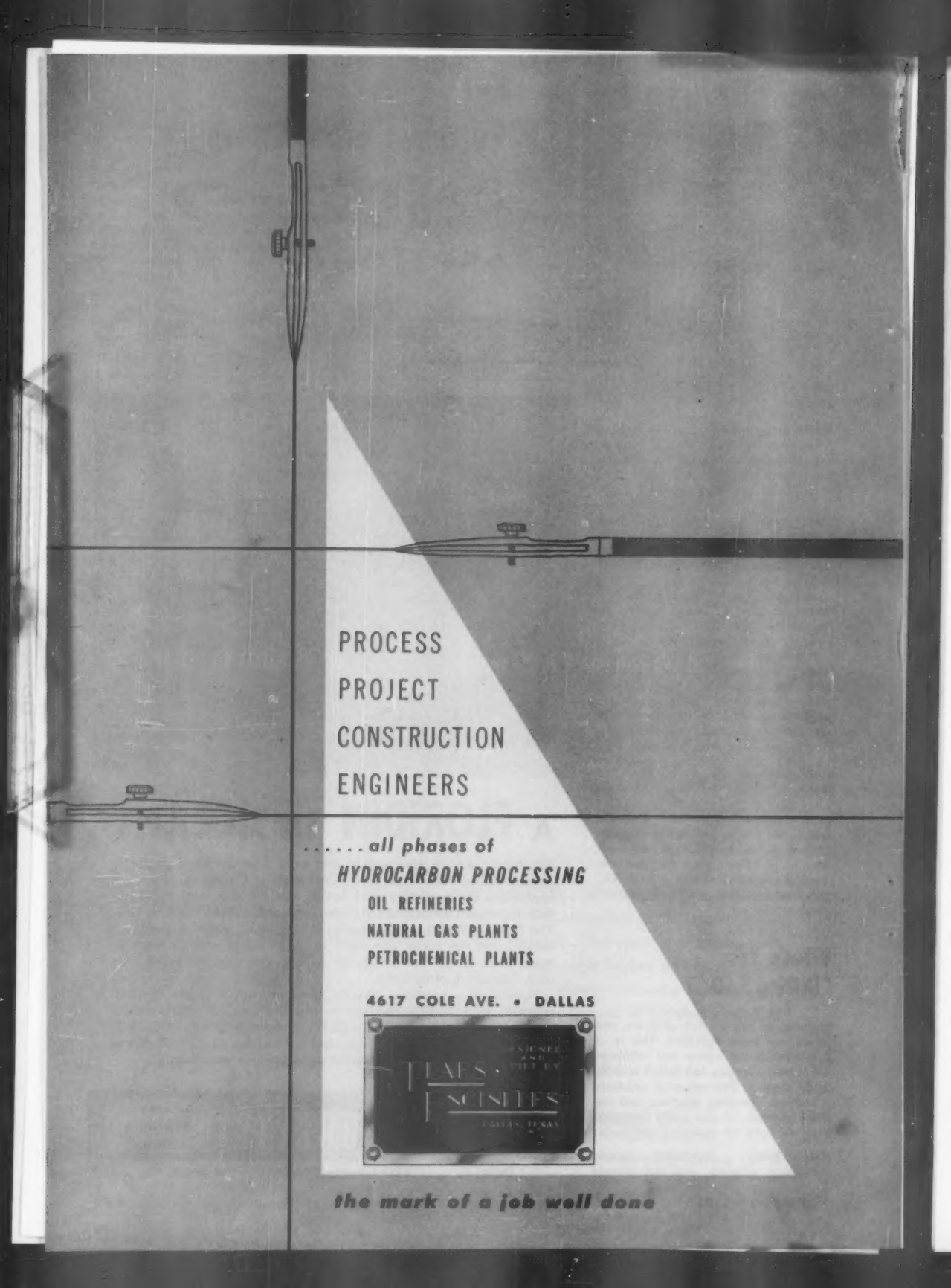
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tractor's organization as a stairway. The top step is the contractor himself, the next step area superintendents, the next step the tool pushers, the next step the drillers, and the bottom step the crewmen. There is a hand rail down the stairway which will help considerably in descending safely, but it won't, of itself, guarantee it. This hand rail is the safety engineer and the formalized safety program. With the aid of this hand rail, the accident prevention program starts down the stairs of the organization towards the goal at the bottom, a goal called "Accident-Free Operation." If because of apathy and a feeling that safety is sissy stuff, the contractor is not cooperative in the program, we slip on the top step, and the whole program is defeated right at the start—safety is left in the laps of the god of chance.

These Tools Ferret Out Corrosion

(Continued from page 120)

the feelers, moving outward, will actuate the stylus assembly and record on the caliper chart.

It is quite possible that the internal diameter of new tubing could be recorded on the caliper chart as chart lines very similar to recordings of corrosion damage. This condition was noted on the caliper charts on a well in South Texas. These chart line deflections look like corrosion and would probably be called corrosion damage on the survey of a well. The well records in this case indicated a new string of tubing and the well had been on production only a short time. Thus the chart line deflections recorded on the caliper chart represented the condition of the tubing as run in the well. The first caliper survey of a well indicates the condition of the tubing as of that date. Then each subsequent survey would indicate the rate of increase in corrosion damage in a continuing corrosion program.

In pumping wells, of course, we have rod wear present to varying degrees of severity. Also it is possible that corrosion damage will be present in the tubing string. The corrosion pits will be recorded as sharp-pointed chart line deflections while the rod wear will be recorded as very erratic chart line deflections.

Acid corrosion . . . Another type of corrosion is the chemical reaction of acid with tubing or casing if the pipe is exposed for a sufficient length of time. Mechanical failures occurred during the acidizing procedure in a

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Chemical inhibitors may be effective.

well and the casing was exposed to acid for several days. Severe corrosion was indicated in the lower section of the casing string.

Equipment application . . . In an effort to insure maximum life of subsurface equipment Otis' use of 316 stainless steel was begun in 1938, a full 18-8 stainless steel being used. Also, R-Monel and K-Monel are being used extensively in subsurface equipment. At the present time 416 heat-treated stainless steel with the physical properties of N-80 tubing in all landing nipples is being used.

In an effort to take care of the initial turbulent blast as the flow passes through a bottom-hole choke, a special flow coupling was designed. This coupling is run in the tubing string above the landing nipple and has an extra wall thickness to resist turbulence of the flow stream. A flow sleeve was made to be run and pulled on a wire line and set just above any subsurface tool for wells that needed this protection and in which the tubing was already in the well.

Every effort must be made to protect the tubing string, and these flow couplings and flow sleeves were designed to absorb the initial turbulence of the flow stream as it passes through the subsurface control.

In an effort to reduce the corrosion, erosion, or cutting due to turbulence, the idea was conceived to direct the flow stream around the subsurface tool. This method of diverting the flow has been accomplished in several chokes that seat in a landing nipple.

The first application of this principle was in the side-door-type crossover choke, where the flow is directed into an annulus area between the choke and outside of a landing nipple. Thus by taking the subsurface tool out of the flow stream the amount of corrosion and erosion on the tool was reduced. This same principle is being used in the new chemical injector tools of the landing nipple design. It is also used in the newest types of side-door chokes and landing nipples.

Often, corrosion damage can be effectively controlled by chemical means. To make chemical control feasible, it is necessary that: (1) a compound having suitable chemical and physical properties be available; (2) the mechanical arrangement of the equipment be such that the chemical compound can be injected where needed with a minimum amount of trouble.

and (3) suitable injecting devices be available.

Organic chemical inhibitors . . . Use of wells having an open-flow string of these agents has proved effective in many areas. In the areas where the use of inhibitors may not have been too successful, the reason is not the ineffectiveness of inhibitors but more often the difficulty of utilizing known techniques of injection. Organic corrosion preventives are now available in both liquid and solid stick form, the former generally being used in wells having an open-flow string of casing communicating with the tubing. The solid stick inhibitor is usually used where the annulus is closed by a packer or other means.

Downhole chemical injector . . . As shown in Fig. 4, the landing nipple is run in the tubing string above the packer without an injection choke in the nipple. After the tubing, landing nipple, and packer have been set in the well, sufficient time should be allowed for the well to clean up before installing the injection choke. The chemical injector choke then is run on a wire line and set in the landing nipple. When the choke is in place, it will force the ball check of the seat in the landing nipple, thus allowing a passage for the inhibitor from the casing into the tubing.

At this stage of the operation, pump pressure will be applied on the casing to overcome the spring holding the check valve ball in the injector choke. This action allows the inhibitor to pass down through the choke, and enter the flow stream at the lower end of the landing nipple.

In wells that have a packer set, and economic conditions do not warrant pulling the tubing, there is a method available to inject the inhibitor from the casing into the tubing. The same type of injection can be accomplished by perforating a hole in the tubing above the packer to allow communication between the tubing and the casing.

BOOKS

BOY IN THE OIL BELT. By Thomas Curtin. Published by Pageant Press, 130 West Forty-Second Street, New York 18. 163 pp. $2.50.

This is a story of life in the oil fields in the early days of the industry, in Pennsylvania. Young Buzz Foster is caught in an ugly battle between two large oil syndicates for control of the rights of the independent worker. His father is employed as an oil-well shooter in Kane, Pa., when all the trouble begins. The vicious murder of Chuck Wade, and the series of brutal fights are only incidental to the real mystery—Who has stolen the valuable quantities of nitroglycerin, and why? Murder, wild fist fights, mystery all add up to a book which would be of interest

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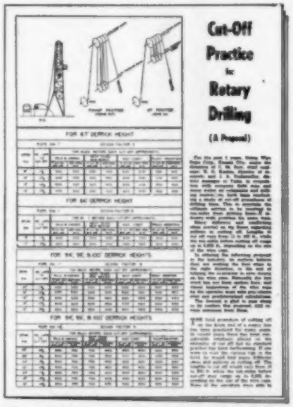

Send Coupon For Reprint of Above Oil Journal Article

The information in this article is based upon a 3 year research study covering 4 major oil regions. It discloses the waste in haphazard practices and guides drillers in setting up Definite Cut-off Procedure which will result in many more ton miles of service and save money on wire rope.

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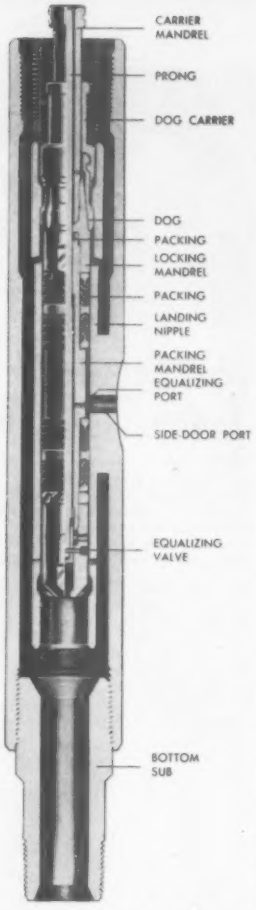

announcing a new side-door assembly with a large by-pass for formation-fracturing

Type A Otis Side-Door Choke

The Type A Otis Side-Door Choke and Landing Nipple assembly is a new Otis dual-completion tool that provides maximum flow capacity, and is especially suited to formation-fracturing and other similar well completion operations. A new design, consisting of a landing nipple mounted concentrically within an outer flow sleeve, allows the assembly to perform all of the various functions of a conventional Otis Side-Door Choke and Landing Nipple assembly, without restricting the flow to the bore of the choke. The large by-pass area around the seating nipple provides a flow course of more than two square inches for full production through the tubing, or for acidizing, conditioning mud, taking bottom-hole pressures, and various other operations. The new Type A Choke also has a built-in equalizing device to facilitate pulling the tool in the event unbalanced or packed-off pressures prohibit full equalization across the tool. Inasmuch as the seating nipple is independent of the tubing nipple, the same choke can be run in either a 2" or 2½" string.

This new choke assembly is another Otis tool that affords exclusive applications not available in any other production equipment on the market. If you want a better way to get better production from your operations, ask your nearest Otis office, or contact us in Dallas, for full details on this and other Otis single- and two-zone production equipment. There's no obligation, of course.

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to the juvenile reader, but of doubtful interest to an adult.

FUELS AND COMBUSTION. By Marion L. Smith and Karl W. Stinson. Published by McGraw-Hill Book Co., 330 West Forty-Second Street, New York 36. 340 pp. $6.50.

Here is a textbook that provides fundamental and factual information on solid, liquid, and gaseous fuels and the problems associated with their combustion. The authors have included the general topics of fuel technology and the relation of air, fuel, combustion products, and the heat released. This discussion helps the student to understand clearly the problems involved in the application of combustion to furnaces, heaters, oil and gas burners, reciprocating internal-combustion engines, gas turbines, and rockets. Basic concepts of modern theories of oxidation are presented in such a way that they will be understandable to students who are not chemistry majors. A complete list of problems and many thought-provoking questions concerning the descriptive material appear at the end of each chapter.

PRINCIPLES OF PETROLEUM GEOLOGY. By E. N. Tiratsoo. Published by McGraw-Hill Book Co., 330 West Forty-Second Street, New York 36. 449 pp. $7.50.

This scholarly volume covers both the academic questions related to the origin, migration, and accumulation of petroleum in the subsurface, and the practical problems of discovering and exploiting oil deposits. These include surface methods, such as geological mapping, aerial survey, and the evaluation of oil seepages and asphalt deposits, and also subsurface methods of discovery, and the integration of physics and chemistry with geology for this purpose. The world's oil fields are reviewed, particularly with reference to their structural and stratigraphic history. The latest techniques of exploitation geology, including petrographic and micropaleontological correlations and electric and radioactive well logging are described. There is a special chapter devoted to he technology of drilling fluids. Three chapters deal with exploitation principles by which oil fields, once discovered, can be economically developed.

Correction

The authors of the article, "Effect of Hydrodynamic Forces on Pipe-Line Crossings of Rivers," which was published in the July 28 issue of the Journal, have called attention to some errors in equations, which appeared in the manuscript.

Algebraic expressions which are in error follow:

1. Equation 1, page 276, should read:

$$f(v\text{-}v)=\frac{1}{(2\pi)^{1/2}}e^{\frac{-(v-v)^2}{2\sigma^2}}$$

2. Equation 7, page 275, should read:

$$\zeta\frac{\partial^3}{\partial(v_x/\sigma_y)}$$

3. The last expression on page 279 should read:

$$\pi\left[(v_1{}^{2}/_{2})(v_2{}^{3}/_{2})\right]2r$$

4. Equation 16, page 280, should read:

$$\eta\cdot\pi\left[(v_1{}^{2}/_{2})\text{-}(v_2{}^{2}/_{2})\right]$$

Drilling With Gas Promises Lower Costs

GAS DRILLING . . . "Used 116 bits and 81½ days total time versus 175 bits and 93 days by conventional method."

(Continued from page 105)

1,500 linear feet per minute to over 3,000 linear feet per minute. No variation in the rate of drilling was noticed throughout these changes. A total of 80,000,000 cu. ft. of gas, including rig fuel, was used during the 81½ days of gas drilling.

Conventional Hughes W-7 and W-7-R rock bits were run almost entirely. A modified Hughes W-7-R bit, with reduced center ports and a small port over each bearing, was tried; but no increase in drilling rate or longer wear of bit was noticed. The conventional bits apparently received enough cooling effect from the reduction in pressure of the gas passing through the ports, since there was very little trouble experienced with the bearings wearing out, or freezing, or cones becoming loose. Reference is made to the bit record where bit No. 5 made 931 ft. in 26 hours with approximately 10,000 to 15,000 lb. weight run on the bit. When this bit was pulled, it was fairly dull, but the bearings were in excellent condition. A rotary speed of from 60 to 75 r.p.m. was used throughout the operation.

Results Obtained

This gas-drilling experiment resulted in the drilling of 8,021 ft. of formation between 1,510 and 9,531 ft. with good results. The results from 1,510 to 5,293 ft. were exceptional. For the entire gas-drilling operation down to 9,531 ft., 116 bits and 81½ days total elapsed time were required on the 2 Cauthorn, as compared to 175 bits and 93 days on the 1 Cauthorn, using the conventional mud-drilling method.

From 1,510 to 4,350 ft. the rate of driling was 90 to 120 ft. per hour with 15,000 to 25,000 lb. weight run on the bits. At 4,350 ft. it was necessary to reduce the weight run on the bits to 6,000 lb. because the hole started going off vertical. At 5,293 ft., a 4° hole developed and the weight run on the bits was reduced to 2,000 to 6,000 lb. to keep the hole within 4°. This resulted in a much slower rate of drilling from that point to 9,531 ft.

Except for three instances, it was necessary to run light on the bits down to 9,531 ft., where gas drilling ceased and the hole was mudded up to drill into the high-pressure gas zone. At 5,722, 7,632, and 8,055 ft., from 25,000 to 50,000 lb. weight was applied to the bits to see just what rate of drilling would result. In all three instances the rate of drilling was 60 ft. per hour or more, but the hole would go off vertical at the rate of ½° per 30 ft. It should be mentioned that crooked-hole trouble was expected in the drilling of this well, since the operators also encountered the same difficulties in drilling the first two wells in the area.

In attempting to correct this crooked-hole trouble, several different types of bits were run, under varying conditions, down to a depth of 5,817 ft. At this point the operator started whipstocking to straighten the hole from 4½°. After whipstocking five times, the hole was back to 2¾° at 5,974 ft. With the use of three drill collars, with a stabilizer run one drill collar off bottom, the hole was brought back to 1½°. However, if more than 6,000 lb. weight was run on the bit the hole would go off vertical.

At a depth of 7,450 ft., three 7-in. drill collars were run in an attempt to keep the hole straight. The hole was 4¼° off vertical at that point and continued to go off.

At a depth of 7,632 ft., a directional survey was run to determine if the hole was deviating in the same direction. This survey showed that the hole was going off in a southwesterly direction from 1,510 to 3,800 ft.; and it was going off in a northwesterly direction from 3,800 to 7,632 ft. With this information it was decided to run more weight on the bits in order to increase drilling rate and allow the well to deviate as much as 7°. Therefore, 25,000-lb. weight was run on the bits from 7,632 to 7,792 ft. at which point the hole was off 6¾°. As a result, the weight was again reduced to 2,000 lb.

At a depth of 8,150 ft. the hole was 7½° off; and at 8,210 ft., because of the slow rate of penetration, it was decided to increase the weight on the bit from 2,000 to 12,000 lb. This weight was run to a depth of 8,639 ft. when it was discovered that the drift-indicator readings for the last few hundred feet of the hole were in error. At 8,639 ft. another directional survey was run and the hole was found to be off 16° at 8,632 ft. and was still going off in a northwesterly direction. Again, the weight on the bits was reduced to 2,000 to 6,000 lb. and was maintained at this rate down to 9,531 ft. At this depth the hole was off 20° and gas-drilling operations ceased.

Just what trouble would result when the hole was first mudded up caused much speculation. In carrying out this operation the operator went to the bottom of the hole with 7⅞-in. o.d. bit and one 5½-in. drill collar. The hole was filled with approximately 700 bbl. of mud having the following characteristics:

9.5	lb. per gallon weight
56	viscosity
0-0	gel strength
5.0	cc. water loss
2/32-in.	cake

One 18 by 6½-in. pump was used to pump the mud. The drill pipe was moved constantly and no trouble was experienced with the pipe trying to stick. Returns on the mud were noted at the surface in 1 hour and 5 minutes. The mud was then circulated for three circulating cycles before pulling out of the hole. There were no cavings in the mud until after getting back on bottom with a 7⅞-in. bit. No trouble was experienced going in the hole until 9,331 ft., where it was necessary to ream from 9,331 to 9,531 ft. There were large amounts of cavings in the returns for about 4 days, but no difficulty was experienced in getting in and out of the hole.

For Future Wells

In future wells drilled with gas, it would appear advisable to use drill collars with the largest diameter that could safely be run in the size hole being drilled, at the very beginning of the gas-drilling operation; and if the hole shows a tendency to deviate, every effort should be made to keep the hole straight by the use of stabilizers. Another feature that probably would be very helpful would be an automatic feed on the rotary brake. In any event, the faster rate of penetration requires greater frequency of deviation surveys in order to have closer control over the straight-hole information.

As more experience is gained, gas drilling promises to reduce footage cost substantially in selected areas. This will enable operators to develop marginal properties which they were previously unable to develop because of high drilling costs.

Acknowledgment to Drilling Contractor

The success of this gas drilling operation was due in a large part to the cooperation of the drilling contractor, Great Western Drilling Co. The crews were very cooperative in carrying out all the safety precautions prescribed, such: No smoking in the area of the rig, no matches or cigarette lighters allowed on the rig floor at any time, no unauthorized personnel allowed on the rig floor at any time, and continual inspection and correction of mechanical equipment in order to prevent sparks from exhausts. It also was observed that the crews had no objection to working with this gas-drilling process, and, in fact, apparently liked the cleanliness feature of the operation.

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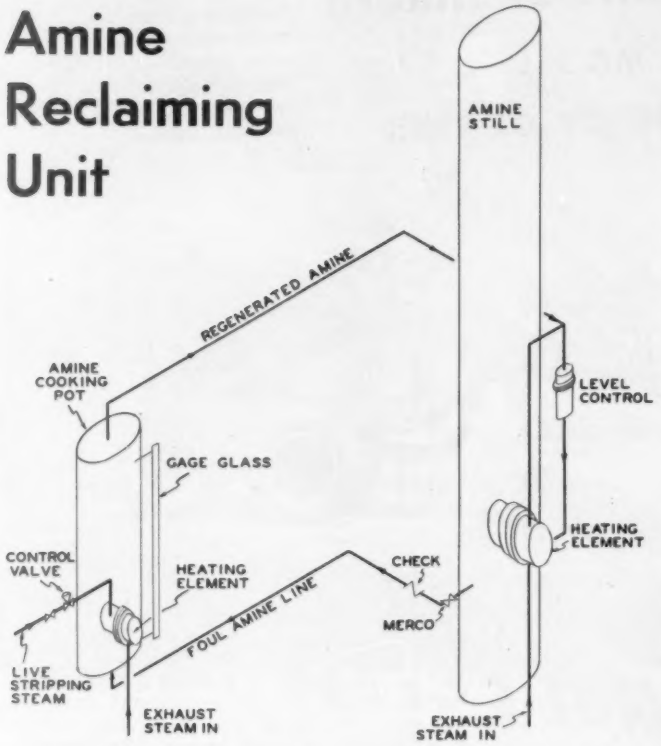
Amine Reclaiming Unit



New method is inexpensive, provides easy operation

A NEW method for clearing amine solution used in processed treating has been developed by George Zorns, chief operator at Phillips Petroleum Co.'s Hobbs, N. M., plant. This new method is inexpensive, provides for easy operation, and is a permanent installation.

The general method of cleaning amine solution is to periodically set a "pig" at the treater and operate this pig until the solution is clear. This pig requires numerous controls and a considerable amount of piping.

The reclaimer in operation at the Phillips plant is permanent and is in continuous operation. The operation requires a minimum of attention and is keeping the amine solution in good shape. This reclaimer has one control, and that is not a necessity. In general all control will be given by the still controls.

How it works . . . The reclaimer is set so that its level is maintained by the treater still-level control. The feed comes out of the still bottom through a merco valve and a check valve. The steam to the heating element is exhaust steam which is taken downstream of the meter on the steam-to-treater-still line.

The steam to the heating bundle in the reclaimer is the same steam that goes to the treater still. Boiling is effected in the reclaimer by a slightly higher temperature in the reclaimer as compared to the still, due to the smaller flow of liquid. The temperature in the reclaimer bundle can increase to the approximate temperature of the exhaust steam and some may flow into the reclaimer if amine is being boiled overhead, although this temperature in the reclaimer is 4° or 5° higher than the temperature in the still. Also, steam condensate is injected into the reclaimer to lower the boiling points of the liquid and serve as a stripping medium to vaporize the amine.

After filling . . . When the reclaimer is full (10 days), the feed is cut off and the exhaust steam is shut off. Live steam is turned into the element and is controlled by a pressure control and motor valve. When the reclaimer liquid is cooked down, condensate is used to fill it back to the original levels. When it is again cooked off the residual is dumped through a valve in the bottom of the reclaimer.

The reclaimer vessel is small compared to the still; however, when the reclaimer unit is shut in and boiled off with live steam, the volume of liquid that goes overhead and collects in the still is not enough to materially affect the level in the still; but, any excess of liquid collects in the surge tank on the unit instead of the still.

Zorns submitted this idea to the "Operating Kinks" session at the recent Natural Gasoline Association of America Permian Basin regional meeting at Odessa, Tex.

Winch Aids Adjustment of Balance Line Between Pits

To regulate the amount of overflow from the first skimming pond to the second pit at its South Cuyama, Calif., waste-water disposal plant, Richfield Oil Corp. is using the swivel-joint hookup shown.

Height of the outlet pipe can be raised or lowered by turning the small winch placed on the wall between the two pits. After the pipe is properly adjusted the winch is locked in place by means of a cam device.

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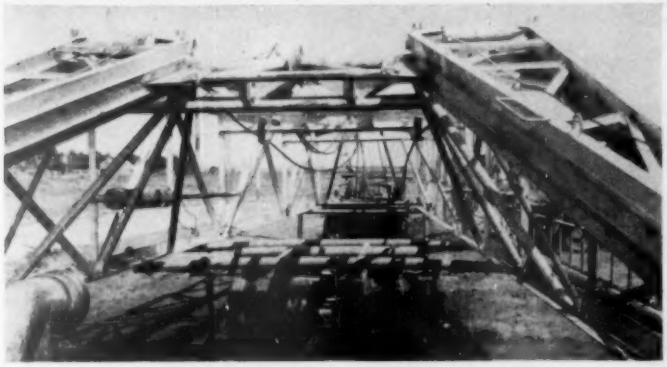


PIPE TRAILER has been extended to transport rotary drilling rig.

These ideas may help you on your job!

1—Pipe Trailer Hauls Rig

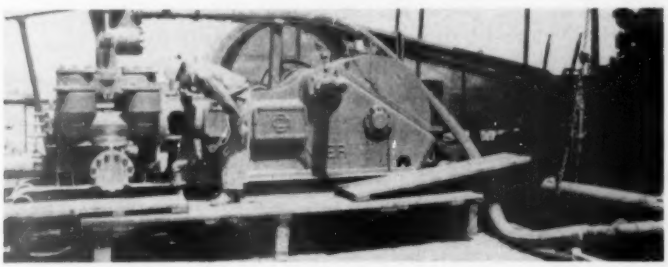
BY converting the bolster on a pipe trailer to fit the middle of a portable drilling rig, one contractor uses the same trailer for moving his derrick as he does for transporting the drill pipe.

Two more bolsters, made from 6-in. pipe, are welded to the front and back of the main bolster by means of 30-in. cross-members. Inside of the 6-in. members, 4-in. joints of pipe are slipped so that they can be inserted when the rig is being loaded.

After the drill pipe has been moved to a new location, the trailer is spotted near the derrick so that the main weight of the derrick will be on the trailer. The 4-in. pipes are then inserted through the 6-in. bolsters and the rig laid down and fastened securely with chains.

The top end of the rig section is laid on a support until it is convenient for the trucker to move it. The truck is then backed under the upper end of the rig section, the support removed, and it is ready to go.

As soon as the rig is spotted on the new location and raised, the 4-in. pipes are removed. The trailer is then ready for handling pipe.



MUD-PUMP hookup, showing piece of flexible hose between pump and regular line leading to standpipe.

2—Simple Mud-Pump Hookup

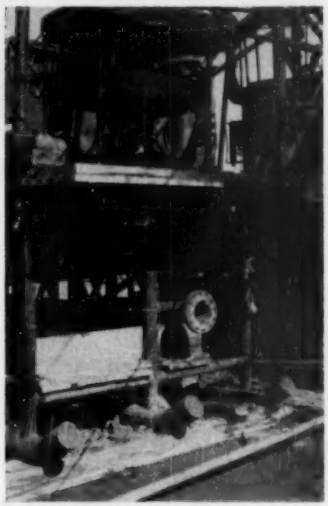
ONE operator in Kansas uses a short length of rotary hose to connect the mud pump to the line leading to the standpipe.

The connection is made solid on the pump end with a support to keep the hose from kinking as it makes a smooth bend around to the union which ties it into the permanent mud line.

Besides making a speedy hookup when fast moving time is important, it eliminates vibration between the pump and the rig which would cause solid connections to work loose and leak.

When it is time to rig down, the one union is parted and the length of rotary hose laid alongside the pump and tied with a piece of soft rope.

After the pump is spotted on the new location, it is simple to untie the hose and connect up the union to the mud line.



MISCELLANEOUS EQUIPMENT can be stored easily beneath rig's superstructure.

3—Storage "Bin"

THE space under the derrick floor on a portable drilling rig may be conveniently used for storing miscellaneous pipe connections and tools by building a tool box of planks and bolting in between the risers on the substructure, according to Carl U. Perry, contractor in Bryan Mound field, Brazoria County, Texas.

The planks are laid on cross-members in the substructure and the box is formed by laying 2 by 4's around the edge of the floor, bolting them down and then setting 2 by 10's on edge inside the 2 by 4's, then nailing them fast.

On top of the floor, another two-tier tool box is made from scraps of 2-in. pipe and 2-in. planks. Here the tools normally used on the derrick floor are placed. The toolbox beneath the floor is reserved for tools not used every day and the larger nipples and tools which are too large for the box on the rig floor.

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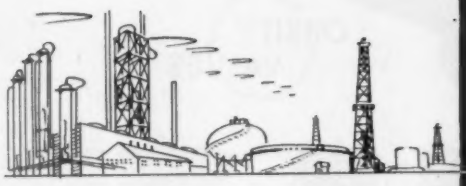

No. 19

PUMPS:

Minimum Continuous Safe Flow of Centrifugal Pumps—2

by E. C. Condict*

THE introduction to this subject was presented last week as Part 18 of the current pump series. Certain basic concepts were explained, and Figs. 1 and 2, temperature rise and pump efficiency correlations, were developed.

The use of these two figures will now be illustrated.

As an example, consider the pump the characteristics of which are shown in Fig. 3. The SOP (shut-off pressure) is 3,200 ft. Determine the minimum continuous safe flow when handling 220° F. water with 19 ft. NPSH (net positive suction head).

Figs. 1 and 2 show that the allowable temperature rise is 20° F. and the efficiency corresponding to the minimum continuous safe flow is 17 per cent. Fig. 3 shows the capacity corresponding to 17 per cent to be 47 g.p.m. Thus the minimum safe continuous flow for the pump whose characteristics are shown on Fig. 3 is 47 g.p.m.

Prevention of flashing . . . The pump with characteristics shown in Fig. 3 can be protected from flashing by installing a bypass line, having a suitable orifice, from the discharge of the pump back to the suction heater. The size of the orifice should be such that it will pass the minimum continuous safe flow. This bypass line cannot go back to the suction of the pump, as the same fluid would be handled over and over again, causing the temperature to rise until the liquid would flash.

There are two fundamental ways of taking care of the bypass flow. One way is to keep the bypass open at all times. In this case the rated capacity of the pump must be the rated capacity of the system plus the minimum continuous safe flow. The second method is to use some flow regulating device. When the pump capacity decreases and approaches the minimum continuous safe flow, a valve in the bypass line is opened. When the flow is above the minimum the valve is closed. This may be done either manually or automatically.

Figs. 1 and 2 may also be used to determine the NPSH required for a new installation. Assume that a pump is to be installed for handling 275° F. water. It is desirable to have a 15° F. allowable temperature rise. This gives a safe margin for possible surges in the suction heater.

The temperature rise portion of Fig. 1 shows that 30 ft. NPSH will be required. This means that the heater must be placed high enough above the centerline of the pump so that after friction and entrance losses have been subtracted from the static elevation, there is available 30 ft. of liquid head over and above the vapor pressure.

When liquids other than water are being handled it would be necessary to draw temperature rise curves based upon the characteristics of the liquid being handled.

Temperature-rise curves for a pump may be calculated by means of Fig. 2. Based on a given pump efficiency the corresponding head is selected from the characteristic curve. For example, at 60 per cent efficiency the pump with characteristics shown on Fig. 3 has a TDH (total dynamic head) of 3,000 ft. The corresponding temperature rise from Fig. 2 is 2.3° F.

For mechanical reasons, such as unequal expansion of pump parts, it is desirable to limit the temperature rise. A maximum temperature rise not exceeding 30° F. is a good practice. However, it is advisable to consult the pump manufacturer. Some materials cannot be operated above a certain temperature regardless of the allowable temperature rise.

Knowing when and how to protect a centrifugal pump from overheating is very important. Figs. 1 and 2 or modifications of them suitable for the liquid being handled enables protection of a pump from flashing.

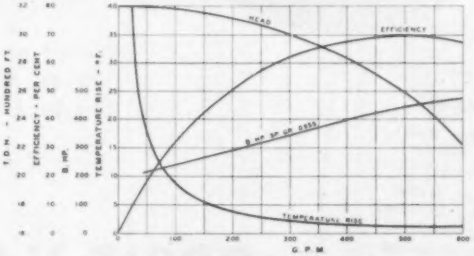

Fig. 3—Centrifugal pump characteristics.

*Pump engineer, De Laval Steam Turbine Co.

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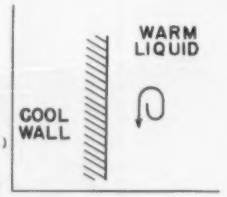
Part 2 of a series

by Dr. B. E. Lauer, Head, Department of Chemical Engineering, University of Colorado

h_f HEAT TRANSFER

COEFFICIENT of HEAT TRANSFER through FILM between SURFACE of COOL VERTICAL WALL and WARM LIQUID



Liquid Movement: Natural Convection

Length of Wall: Long (Over 0.15 ft.)

EQUATION:

$$h_f = 0.13\frac{k}{L}\left[\frac{L^3\rho^2\beta g\Delta t g}{\mu^2}\cdot\frac{C_p\mu}{k}\right]^{\frac{1}{3}}$$

or

$$h_f = 0.13k\left[\frac{\rho^2\beta g\Delta t g C_p}{\mu k}\right]^{0.33}$$

TECHNOLOGY:

h_f - Film coefficient of heat transfer, BTU/hr.sq.ft.°F.

k - Thermal cond. of liquid at t_f, BTU/hr.sq.ft.°F./ft.

L - Height of vertical wall, ft.

ρ - Density of liquid at t_f, lb./cu. ft.

g - Acceleration of gravity. 4.17×10^8 ft./hr.^{2}

β - Coefficient of volumetric expansion of liquid at t_f.

Δt - Temperature difference between wall and liquid, °F.

μ - Viscosity of liquid at t_f, lb./ft. hr.

C_p - Specific heat of liquid at constant pressure in BTU/lb. °F.

t_f - Film temperature, assumed as arithmetic average of wall temperature and bulk liquid temperature, °F.

LIMITATIONS: Equation applicable for values of the function.

$$\left[\frac{L^3\rho^2\Delta t g C_p}{\mu k}\right] \text{ over } 10^9$$

For plate over 0.15 ft. in height.

SOURCES OF DATA: For physical constants for use in above equation see Chemical Engineers' Handbook - J. H. Perry (1948).

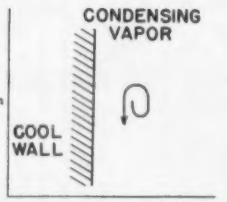
for ρ -- see pp. 130-148, 176-196, 1683.
μ -- see pp. 370-374, 1198, 1696.
β -- see p. 200-202, 1676.
k -- see pp. 459-461, 1303, 1697.
C -- see pp. 225-235, 297, 1688, 1696.

REFERENCES:

1. Introduction to Heat Transfer, Brown and Marco, pp. 114.
2. "The Basic Laws and Data of Heat Transmission," W. J. King, Mechanical Engineering, 57, 560, May, 1932.

See A 2 a (1) for others.

COEFFICIENT of HEAT TRANSFER through FILM between SURFACE of COOL VERTICAL WALL and CONDENSING VAPOR



Gas Movement: Natural Convection

Vapor: Single Pure Component

Condensation: Filmwise

EQUATION:

$$h_f = 0.943\left[\frac{k^3\rho^2\lambda g}{\mu L\Delta t_f}\right]^{0.25}$$

TERMINOLOGY:

h_f - Film coefficient of heat transfer BTU/hr.sq.ft.°F.

k - Thermal conductivity of condensate at condensate temperature, t_f, in BTU/hr. sq. ft. °F./ft.

ρ - Density of the condensate at t_f, °F.

g - Acceleration of gravity. 4.17×10^8 ft./hr.^{2}

λ - Latent heat of condensation of vapor at saturation temperature in BTU/lb.

μ - Viscosity of the condensate at condensate temperature, t_f, in lb./ft. hr.

L - Height of vertical wall in ft.

Δt - Temperature difference between wall and gas in °F.

t_f - Condensate temperature assumed as equal to dew-point temperature of vapor minus 3/4 (Δt), °F.

LIMITATIONS: Equation only useful for filmwise condensation. DFopwise condensation as induced, for example, by the addition of small amounts of stearic acid to steam may increase h_f several fold.

SPECIAL OBSERVATIONS: Brown reports that h_f solved by this equation gives results below experiment and suggests that the constant should be raised to 1.13.

SOURCES OF DATA:

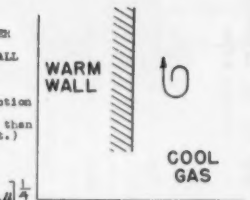
For physical constants for use in above equation see Chemical Engineers' Handbook - J. H. Perry (1948).

for ρ -- see pp. 130-148, 176-196, 1683.
μ -- see pp. 370-374, 1198, 1696.
k -- see pp. 459-461, 1303, 1697.
λ -- see pp. 210-218, 299, 249-281, 1685.

REFERENCES:

1. Heat Transmission, William H. McAdams, pp. 260.
2. Introduction to the Transfer of Heat and Mass, Eckert, pp. 173-177.
3. Process Heat Transfer, Kern, pp. 257-260.
4. Elements of Heat Transfer and Insulation, Jakob and Hawkins, pp. 161-163.
5. Unit Operations, Brown, pp. 448-449.
6. Chemical Engineers' Handbook, Perry, pp. 476.

COEFFICIENT of HEAT TRANSFER through FILM between SURFACE of WARM VERTICAL WALL and COOL GAS



Gas Movement: Natural Convection

Length of Wall: Short (less than 2 ft.)

EQUATION:

$$h_f = 0.548\frac{k}{L}\left[\frac{L^3\rho^2\beta g\Delta t}{\mu^2}\cdot\frac{C_p\mu}{k}\right]^{\frac{1}{4}}$$

TERMINOLOGY:

h_f - Film coefficient of heat transfer, BTU/hr.sq.ft.°F.

k - Thermal conductivity of gas at t_f, BTU/hr. ft.^{2} °F./ft.

L - Height of vertical wall, ft.

ρ - Density of gas at t_f, lb./cu. ft.

g - Acceleration of gravity. 4.17×10^8 ft./hr.^{2}

β - Coefficient of volumetric expansion of gas at t_f. (1/°R)

Δt - Temperature difference between wall and gas, °F.

μ - Viscosity of the gas at t_f, lb./ft. hr.

C_p - Specific heat of gas at constant pressure, BTU/lb.°F.

t_f - Film temperature, °F. (Assume to be arithmetic average of wall temperature and bulk gas temperature.)

LIMITATIONS: Equation is applicable for values of the function.

$$\left[\frac{L^3\rho^2 g}{\mu^2}\cdot\frac{\beta\Delta t}{}\cdot\frac{C_p\mu}{k}\right] \text{ from } 10^3 \text{ to } 10^9.$$

For other values use graphical methods of reference 3 below.

Is useful for only short (less than 2 ft.) length of wall.

SPECIAL CASE: Air at room temperature and one atmosphere:

$$h_f = 0.28\left[\Delta t/L\right]^{0.25}$$

SOURCES OF DATA: For physical constants for use in above equation see Chemical Engineers' Handbook - J. H. Perry (1948).

for ρ -- see pp. 130-148, 176-196, 1683.
μ -- see pp. 370-374, 1198, 1696.
β -- see p. 200-202.
k -- see pp. 459-461, 1303, 1697.
C -- see pp. 225-235, 297, 1688, 1696.

REFERENCES:

1. Heat Transmission, William H. McAdams, pp. 227-251.
2. "Free Convection," W. J. King, Mechanical Engineering, 54, 347 (1932).
3. "Notes on Heat Transmission," E. H. Heilman, Trans. Am. Soc. Mech. Engrs., FSP 51,387-304(29)

QUESTIONS ON TECHNOLOGY

by W. L. Nelson
Technical Editor

Amount of Gas In Crude Oil

"What is the amount of gas contained in a crude oil, and what is its composition?"—S.C.

There is no real or specific answer to the question because there are so many kinds of crude oils, they are collected at many pressures, some are exposed to atmospheric pressure, and some are even stored in tanks where breathing occurs each day. Finally, the gas is separated at the refinery at pressures ranging from atmospheric to perhaps 20 psig. and at various temperatures. However, the question is a constant source of difficulty to process and plant engineers and hence some of the limiting situations are investigated here.

Table 1 shows the analyses of several crude oils (Petroleum Refinery Engineering, third edition, page 96, McGraw-Hill Book Co., Inc., New York, 1949) as well as three analyses which were computed (see later herein). It might be supposed that the gases from these crude oils would include most of the methane, ethane, and propane contained in the wild crude oil, but computations indicate that substantial amounts of these remain with the gasoline at the topping plant (19.7 psia. and 90° F.). Thus, the three wild crude oils of Table 1 which contain 0.71 to 1.27 weight per cent of butanes and lighter, suffer volume per cent losses in the refinery (19.7 psia. and 90° F.) of only 0.2-0.3 per cent. The final losses at the refinery seem to be little affected by the composition of the fluid in the field reservoir because three widely differing reservoir conditions are represented by the three last crude oils (a, b, and c) of Table 1. This leads immediately to the conclusion that large topping-still losses occur mainly with those crude oils that have been collected at pressures of 20 psia. or more in the field because the three computed crude-oil compositions of Table 1 were all separated from gas in the field at atmospheric pressure.

The technical literature does not reveal anything about the composition of the gas evolved in a topping plant except general statements indicating that it is very rich in butane and higher-boiling hydrocarbons. Accordingly, the compositions of gases that will be liberated from the three last crude oils of Table 1 were computed for a topping plant separator held at 90° F. and at 5 psig. These compositions are shown in Table 2. In general, it appears that the percentage of methane is seldom large unless the crude oil has been collected and kept under high pressure. If the crude oil is exposed in fixed-roof tanks the gas evolved in the refinery will be even richer than those shown in Table 2, having molecular weights of even 45 or 50, and if the topping-plant separator is at a temperature higher than 90° F., the gases will be even richer in butane-plus hydrocarbons.

The cubic feet of gas liberated in a topping plant can be estimated from the liquid volume percentage loss that occurs. This loss is very much less than the 0.3-2.0 per cent losses that are encountered in laboratory distillations because in the topping plant the gases are absorbed to some extent in the gasoline (and gasoline reflux). Fig. 1 was prepared to show the general magnitude of the gas evolution during topping.

TABLE 2—COMPOSITIONS OF TOPPING STILL GASES
(Mol per cent)

	Gas (a)	Gas (b)	Gas (c)	High pressure field separator*
C_1	21.6	14.9	30.5	25-60
C_2	33.4	25.9	16.4	15-35
C_3	18.8	22.1	18.8	10-15
C_4	15.8	20.5	18.8	5-10
C_5	7.1	10.8	9.5	2-5
C_6	2.0	3.8	4.1	1-3
C_7+	1.3	2.0	1.9	0-1
M.W.	39.2	36.5	41.1	30-36*
Loss (L.V. %)†	0.44	0.29	0.24	0.4-0.6
Loss (cu. ft.)†	7.05	4.55	3.86	

*Estimated for pressures up to 30 psig. and never exposed in fixed roof tanks. †At 5 psig. and 90° F.

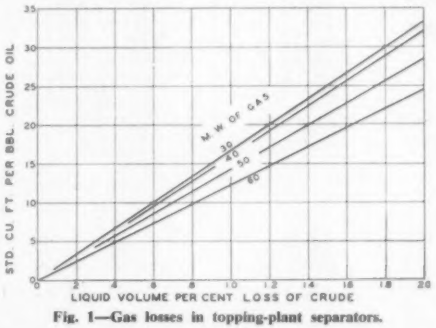
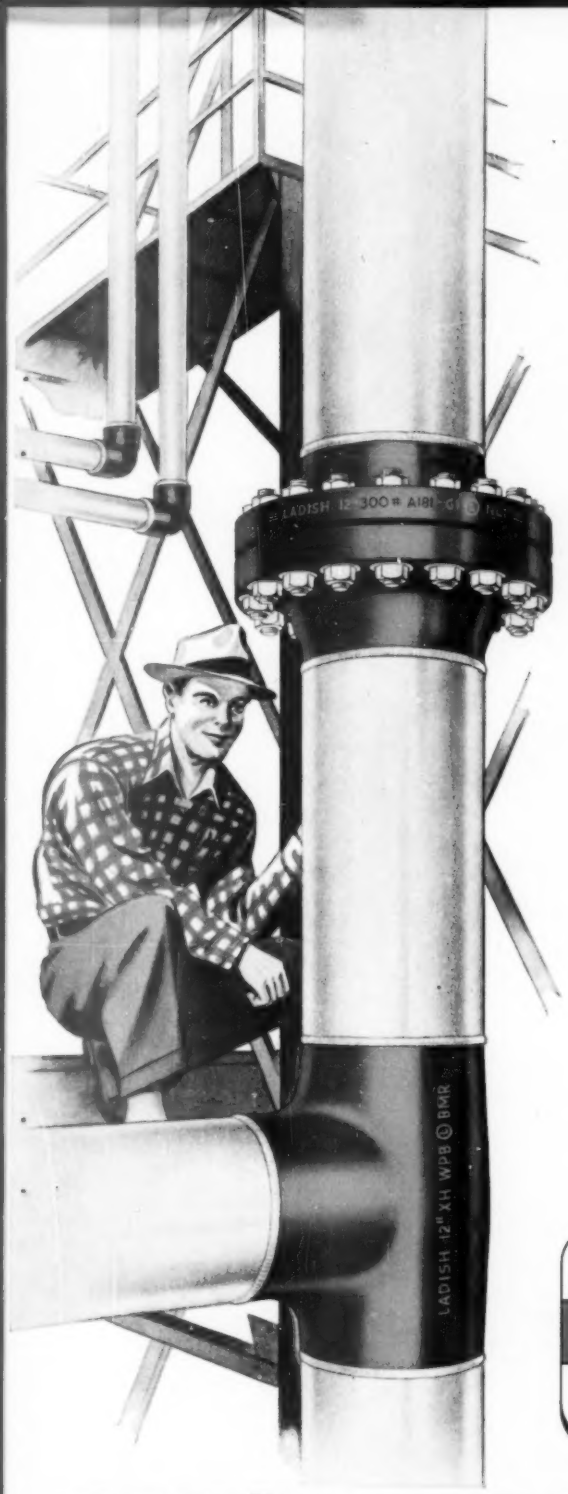


Fig. 1—Gas losses in topping-plant separators.

TABLE 1—FRACTIONAL ANALYSES OF SEVERAL WATER-FREE, HYDROGEN SULFIDE-FREE CRUDE OILS, WEIGHT, PER CENT

	Michigan	Van Zandt	Cabin Creek	Eureka	Corning	Mid-Cont.	Creole	Cumberland	Headlton	Fargo	Jusepin‡ 250 psi., 100° F.	Kirkuk¶ 50 psi.	Mid-Continent collected at 3,000 psig.	Mid-Continent collected at 12 psig.	Computed* (a)	Computed* (b)	Computed* (c)
Methane	...	...	trace	trace	trace	...	0.01	trace	...	...	6.25	0.07	7.0	0.003	0.01	0.01	0.02
Ethane	...	0.01	0.04	0.02	0.04	0.02	0.04	0.03	...	...	3.64	0.17	2.4	0.03	0.10	0.10	0.06
Propane	0.16	0.16	0.39	0.25	0.22	0.22	0.09	0.48	...	...	6.29	0.22	3.0	0.26	0.23	0.36	0.33
Isobutane	0.11	0.33	0.44	0.35	0.25	0.28	0.05	0.25	0.14	0.39	3.16	0.21	2.8	0.90	0.37	0.80	0.77
Butane	0.48	0.53	1.08	0.66	0.51	1.18	00.8	1.15	0.78	1.61	4.07	0.49					
Pentane-plus	99.25	98.97	98.05	98.72	98.98	98.30	99.73	98.09	99.08	98.00	76.59	98.84	84.8	98.80	†99.29	†98.73	†98.82

*Collected at 14.7 psia. in field tanks. †Pentane is 0.52 weight per cent, 1.34 per cent, and 1.32 per cent respectively. ‡Barnes, K. B., "Field Processing of Oil and Gas," Third World Petroleum Congress 1951, p. 278. ¶Anon., "Crude Stabilizing Plant . . .," The Oil and Gas Journal, Feb. 11, 1937. (a) Little gas in reservoir fluid. (b) Rich gas in reservoir fluid. (c) Much methane and gas in reservoir fluid.



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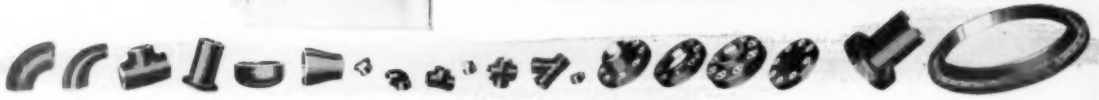

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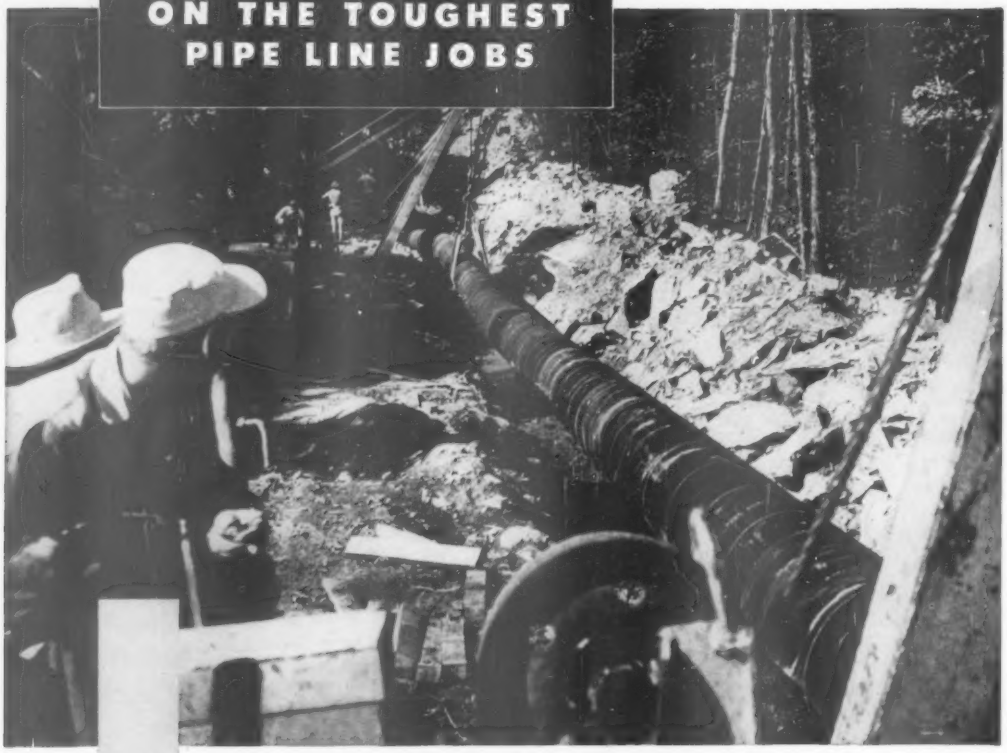

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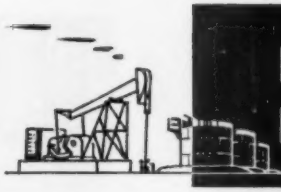


Range of Uniformly Streamline Flow in Porous Media

by Ralph F. Nielsen*

IT has been pointed out previously that the permeability k of a sample of a porous medium to a single fluid is independent of the fluid and other conditions only within certain limits. The permeability to gases, for instance, increases somewhat with decreasing mean pressure due to "slip." For samples of average permeability the variation due to slip may amount to only a few per cent.

Aside from slip and certain other chemical and physical interactions with the solid, any departure from streamline flow in the pores will cause inconsistencies in value of k.

Just as in the case of flow in conduits, Reynolds' criterion (Engineering Fundamentals No. 481) may be applied to determine the velocity below which the flow is uniformly streamline. For smooth cylindrical tubes the Reynolds number below which the flow is streamline is in the neighborhood of 1,500. For porous media, however, the value of the number is very much less. Fancher, Lewis, and Barnes[1] found the value to be about unity, taking the D of Equation 1 to be an average grain diameter as obtained from a sieve analysis. Other studies[2] have shown that the Reynolds number below which the flow is streamline is between 0.1 and unity, the D of Equation 1 being taken from Equation 6.

Since reliable permeability measurements are important in reservoir engineering it is convenient to have an expression for the pressure gradient, in terms of the properties of the porous medium and fluid used, below which it could be safely assumed that the flow is streamline. If Reynolds' criterion is to be applied the Reynolds number:

$$Re = \frac{Dus}{z} \qquad (1)$$

must be evaluated, necessitating some definition of u and D. A sort of average velocity u may be defined as the volumetric rate at some point per unit cross-section, divided by the porosity, expressed as a fraction, or:

$$u = q/f \qquad (2)$$

A rather arbitrary definition of the average pore diameter D may be made by considering a solid penetrated by parallel cylindrical capillaries and having the same permeability and porosity as the porous medium. The porosity of such a system is:

$$f = \frac{\pi n D^2}{4} \qquad (3)$$

where n is the number of capillaries per unit cross-sectional area. The flow through this system per unit area, is, according to Poiseuille's law:

$$q = \frac{\pi n D^4 \, dP/dl}{128 z} \qquad (4)$$

where all units are cgs. The permeability in millidarcies is given by:

$$k = \frac{zq \times 10^{11}}{dP/dl} \qquad (5)$$

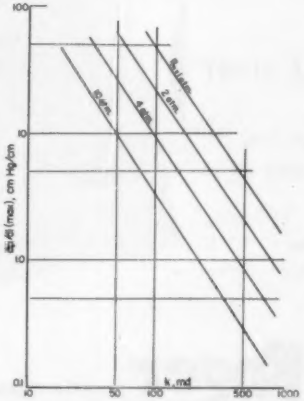


Fig. 1—Pressure gradient for flow of air through a porous medium.

Combination of these equations gives an expression for D:

$$D = 18 \times 10^{-6} \, (k/f)^{1/2} \qquad (6)$$

With D and u defined by Equations 6 and 2 it has been found that the uniformly streamline range is limited to Reynolds numbers below a few tenths.

From Equations 1, 2, 5, and 6 the Reynolds number is:

$$Re = \frac{18 \times 10^{-17} \, k^{1.5} \, s \, dP/dl}{z^2 \, f^{1.5}} \qquad (7)$$

If it be assumed that in an extreme case the streamline range is below Re = 0.1, then the maximum pressure gradient for streamline flow is given by:

$$\frac{dp}{dl} \text{ (max)} = \frac{4.5 \times 10^6 \, \mu^2 \, f^{1.5}}{s \, k^{1.5}} \qquad (8)$$

where dp/dl is in centimeters of mercury per centimeter, μ is in centipoises, and s is in grams per cubic centimeter. Thus, for naphtha at room temperature, where $\mu = 0.5$ and s = 0.7, dp/dl (max) for a core of porosity 0.2 and permeability 750 is about 6 cm. of mercury.

For air at room temperature, s = 0.0012 P_m where P_m is the mean pressure in atmospheres, and μ = 0.0183, whence:

$$\frac{dp}{dl} \text{ (max)} = \frac{1.1 \times 10^6 \, f^{1.5}}{k^{1.5} \, P_m} \qquad (9)$$

where the gradient is again in centimeters of mercury per centimeter. Fig. 1 shows the pressure gradient above which there may be departure from uniformly streamline flow for a core of porosity 0.15, as calculated from Equation 9. In making permeability measurements with air, therefore, the pressure drop in centimeters of mercury per centimeter core length should be kept below the values indicated by the figure.

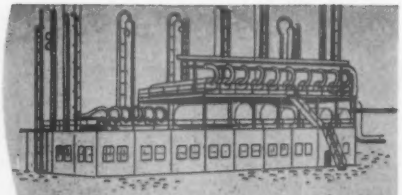
References

1. Fancher, Lewis, and Barnes, Mineral Industries Experiment Station Bulletin 12, Pennsylvania State College, 1933.

2. Traugh, M. S. Thesis, Pennsylvania State College, 1950.

*Associate professor, petroleum and natural-gas engineering, Pennsylvania State College.

Proof of performance:



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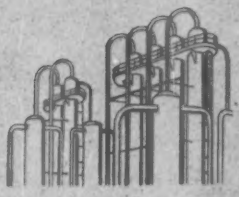

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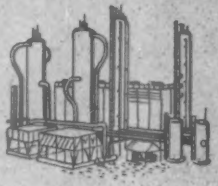

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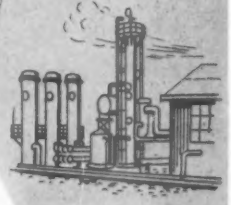

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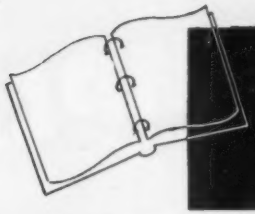


BUTTERFLY VALVES . . .

Flow Characteristics

by C. A. Dally*

WITH the exception of a few specially designed valves, butterfly valves are not used as self-operated regulators but are operated by a control instrument or pilot valve. The sensitivity of valve response required by the process is of considerable importance in the selection of the operating equipment. The gap between the curves of "Torque to Open" and "Torque to Close" in Fig. 1, Installment No. 133 (August 11, 1952), indicated that a hysteresis, or dead spot, will occur in the response of the valve to changes of pressure on an operating device to effect a reversal of valve movement. (The operation of electric gear motor drives, of course, is not affected by the variation in operating torque, and such units are sized to provide the maximum operating torque required.)

Valve positioners . . . Springless-type diaphragm motors or cylinder drives utilize a valve positioner which will determine the sensitivity to a large degree. However, it is accepted practice to size such operators so that the maximum torque which they are capable of producing is from two to three times the maximum operating torque required by the valve. This is done to insure adequate speed of operation with minimum cycling.

Spring-type diaphragm motor . . . The selection of such a motor presents a more difficult problem. Theoretically it should be possible to use a diaphragm motor large enough so that the relation between diaphragm pressure and valve travel would be almost the same as the spring characteristic of the motor. On many applications this is possible. However, on some applications either of two practical limitations may be encountered. The motor required may be so large in relation to the valve body that it is not feasible to mount it on the valve. Or it may be so large that it is not economically feasible to produce it in competition with other types of drives. Thus, the required sensitivity of response will dictate the motor size as well as the use of a valve positioner. The use of a valve positioner does not, however, make available any additional spring force from the motor; so the selection of a spring-type motor must also reflect its spring limitations.

In the selection of motors for operating butterfly valves both the area of the diaphragm, or piston, as well as the available travel of the motor are important. The torque produced on the valve shaft will be determined by the stem force, which is an area function, and the valve-lever length, which is a function of the motor-stem travel and the desired angular movement of the valve. Generally speaking, it is desirable to utilize an operating device with as long a stroke as possible that can be practically mounted on the valve. This will reduce the overhung load on the valve shaft as well as the effect of lost motion in the linkage on the valve response.

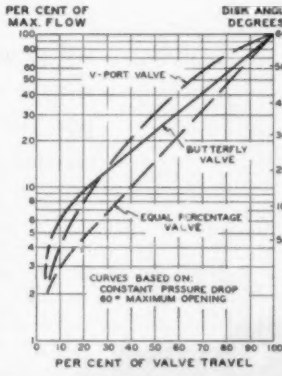

PER CENT OF MAX. FLOW
DISK ANGLE DEGREES
V-PORT VALVE
BUTTERFLY VALVE
EQUAL PERCENTAGE VALVE
CURVES BASED ON: CONSTANT PRESSURE DROP 60° MAXIMUM OPENING
PER CENT OF VALVE TRAVEL

Fig. 1—Flow-characteristic curve of butterfly valve compared with V-port and equal-percentage control valves.

Flow Characteristics

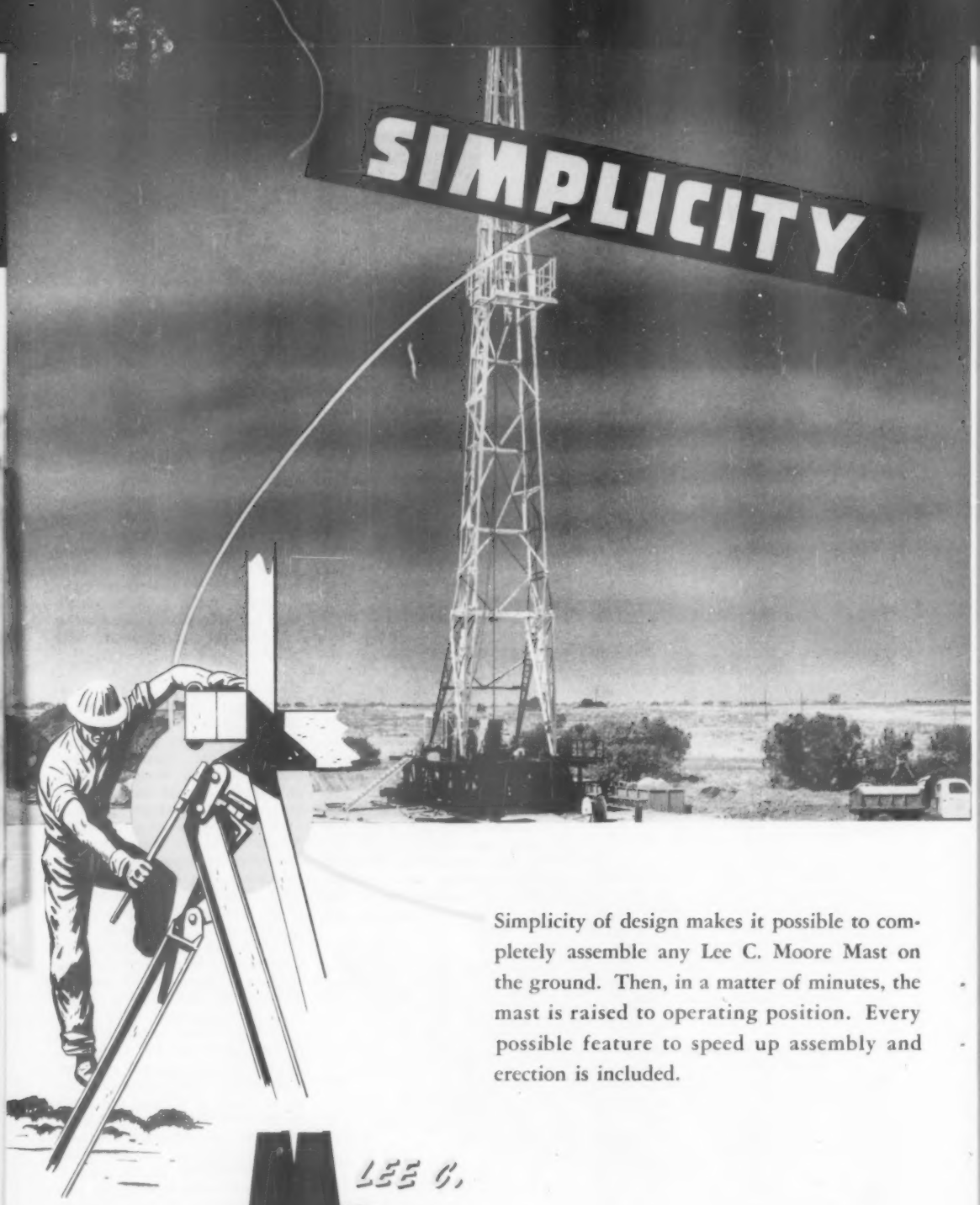
On applications where a large variation of flow or pressure drop is anticipated the process engineer must size and select the control valves required with due consideration to their flow characteristic and rangeability. Using the values of the flow coefficient obtained by test for swing through type butterfly valves, the flow-characteristic curve illustrated in Fig. 1 of this installment has been plotted based on an arbitrarily selected maximum valve opening of 60°.

Equal percentage . . . The curve indicates that the butterfly valve is basically an equal-percentage valve; i.e., equal changes in valve travel will result in equal percentage changes in flow. When considered only in the light of the change in open area of the valve for equal changes in valve travel—which is recognized as not being an equal percentage function—this characteristic curve does not appear to be justified. However, both the velocity of the approach of the fluid as well as the diverting action of the disk, which are both functions of the disk position, combine with the area function to influence the shape of the flow-characteristic curve making it an equal percentage curve.

Like the torque curves in Fig. 1 of Installment No. 132 (August 4, 1952), this curve is based on a constant pressure drop across the valve at all angles of opening and merely illustrates the inherent flow characteristic of the valve. It is not representative, however, of the actual flow characteristic of the valve in the normal system in which the pressure drop across the valve increases as the flow decreases.

A study of Fig. 1 of this installment will lead to several conclusions regarding butterfly valves that will assist in their correct application.

*Continental Equipment Co., Coraopolis, Pa. From paper presented at seventh annual process instrumentation symposium at Texas A. & M. College, 1952.



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How to Maintain Oil-Field Chains—2

by Dave Breith*

Proper oil . . . The next question of lubrication is: What weight oil should be used? The easiest answer to that one is: Use about the same weight oil for chains as is used in an automobile. The cost of chains on a drilling rig can easily approach the cost of a car. If they are not treated with respect and given proper care the cost can be higher.

Next thing to think about is how to get the oil into the chain on the rotary drive. If an oil-bath chain case is used, the oil level in the chain case at its lowest point should reach a point on the bottom strand of the chain slightly above the head of the pin or rivet. This will keep the chain well lubricated, but hold the friction of the chain passing through the oil at a minimum; thus foaming action of the oil will be reduced.

Lubricator . . . If an oil-bath case is not in use, a lubricator should be mounted on the chain guard, or somewhere on the draw works close to the driving sprocket. From the lubricator an oil line should be run to a point between the strands of the chain, just above the bottom strand, so that the oil will run into the chain at a point near the sidebars, just before the chain enters the driving sprocket.

If the oil is so directed into the chain, the action of the rollers and the bushings will approach that of an oil pump, forcing the chain to oil all its working parts, between the rollers and bushings, then between bushing and the chain pins.

When oil is dripped onto the top strand of the chain, most of it is thrown away from the working parts by centrifugal force before it can enter into chain and be effective.

A lubricator and feed line as recommended can be easily and inexpensively built and installed by any oil-field welder or the crew.

Draw-works chains . . . Chain drives within draw works of modern design are enclosed in oil-bath chain cases, and the oil level should be kept to the specified level as indicated by the rig manufacturer. In most cases of this type an oil-level inspection plug is provided.

Within those rigs that do not have oil-bath chain cases, a lubricating system built along the same principles as outlined for the rotary drive should be used. The oil should run into the chain at a point on the drive, so that it enters the inner strand as it enters a sprocket.

Oil can be used too sparingly, and by the same token, excessively. Enough oil should run into the chain to keep it well oiled, but not so much that a large amount runs off and is wasted.

Oil should not be run into idle chains; this is wasteful and unnecessary. A shutoff should be handy to stop the oil flow to the inactive drives when drilling ahead.

Where the rig manufacturer has equipped the rig with an oil pump-spray lubricating system, frequent checks should be made to see that the oil pump is producing and maintaining proper pressure, and that the pump suction screen is clear of sediment or foreign matter which might reduce volume and efficiency.

Regular checks should be made to see that all oil lines are flowing freely and are not out of place, directing the oil to the chain in a manner indicated by the manufacturer. Should a chain break and be replaced or repaired, the oil lines should immediately be repaired.

*Chain Belt Co., Milwaukee.

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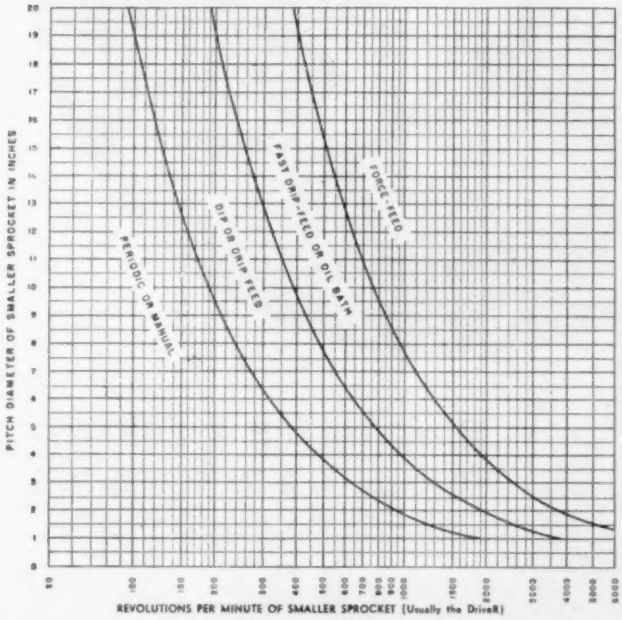
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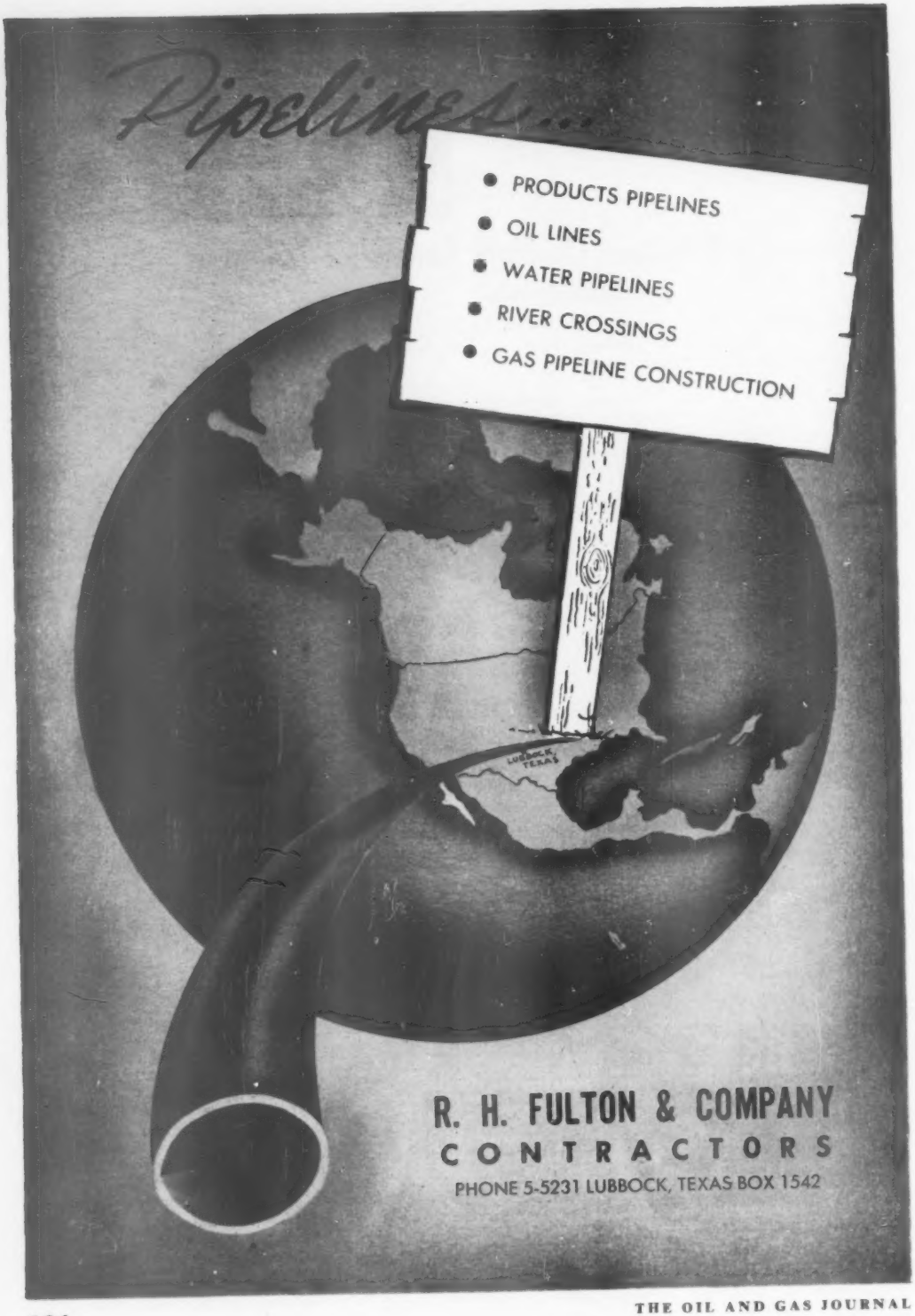
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Pipe-Line Construction

HERE is The Oil and Gas Journal's bi-weekly survey of the rapidly expanding pipe-line industry. For convenience of Journal readers the various projects are separated into the different industry divisions. To simplify the report, all projects which are not yet contracted are identified with a • preceding the name of owner companies.

Crude-Oil Pipe Lines

• **Cities Service Pipe Line Co.**—64 miles, 18-in., planned, South Lake, Tex., to Lake Charles, La. Completion date 1-1-53.

Continental Pipe Line Co.—105 miles, 8-in., contracted, Rincon to northwest of Sullivan City on to Port Isabel, Tex. Western Const. Co. Completion date 9-30-52.

• **Continental Pipe Line Co.**—217 miles, 12-in., planned, Wichita Falls, Tex., to Ponca City, Okla. Completion date 1952.

• **Cooperative Refinery Association.** — 48 miles, 6-in., planned, Phillipsburg, Kans., to Holdredge, Neb.

• **Gulf Refining Co.** — 80 miles, 24-in., planned, Midland to Colorado City, Tex.

22 miles, 10-in., planned, Wortham to Corsicana, Tex.

• **Humble Pipe Line Co.**—4, 6, 8, 12-in., proposed, Upton and Reagan counties, Texas.

201 miles, 12-18-in., planned, Hawkins to Baytown, Tex.

• **Interstate Oil Pipe Line Co.**—30 miles, 16-in., planned, Moore to Flora, La. Completion date 1953.

68 miles, 16-in., planned, Raceland to Anchorage, La. Completion date 11-52.

21 miles, 12-in., planned, Duck Creek and Bayou Sale to New Iberia, La. 9-52.

63 miles, 12-16-in., planned, Flora to Bunkie, La. Completion date 12-31-52.

138 miles, 22-in., planned, Shreveport to Anchorage via Bunkie.

Interstate Oil Pipe Line Co.—55 miles, 16-in., planned, Sunset to Anchorage, La. Houston Contracting. Completion date 12-52.

• **Magnolia Pipe Line Co.**—29 miles, 8-in., planned, Midland County, Texas area.

Malco Refineries, Inc.—60 miles, 4-in., under way, Pettigrew, Tocito field to Hospah field (San Juan basin, New Mexico).

• **Pan American Pipe Line Co.**—27 miles, 26-in., planned, Genoa to Texas City, Tex. Completion date 12-52.

40 miles, 14-in., planned, Arden Station in Irion County to Eldorado Station in Schleicher County, Texas. 10-52.

Pasotex Pipe Line Co.—195 miles, 8-in., under way, El Paso to Wink, Tex. McVean & Barlow, contractor.

Platte Pipe Line Co.—1,075 miles, 16-20-in., under way, Worland, Wyo., to Wood River, Ill. Completion date 1952.

Worland, Wyo., to Holdredge, Neb. R. H. Fulton & Co., contractor. A. A. Carrigan, spreadman at Scotts Bluff, Neb.

Holdredge, Neb., to Kansas State Line, Fulton & Brodie, contractor, J. T. Brodie, spreadman.

Section 7, Missouri River to Salisbury, Mo., and Section 8, Salisbury to Mississippi River, under way. O. R. Burden Construction Co. Al Perry, spreadman at Carrolton, Mo.; river crossing field office, Hartford, Ill. Dick Jernigan, spreadman.

• **Progress Pacific Pipeline Co.** — 1,100 miles, 24-in., planned, Odessa, Tex., to Los Angeles Harbor, Calif.

Rancho Pipe Line System.—455 miles, 24-in., under way, McCamey to Houston, Tex. Completion date late 1952. (Joint project with Sinclair Pipe Line Co., Pan American Pipe Line Co., Tidewater Pipe Line Co., Nantucket Pipe Line Co., Phillips Pipe Line Co., and Ashland Pipe Line Co. with Shell Pipe Line Corp. handling construction and operation.)

McCamey to Cedar Valley near Austin, Tex. Anderson Bros. Corp. A. Kilgore, spreadman at Menard, Tex.

Austin to Shell's Deer Park Refinery (Houston area).

Deer Park refinery west to Brazos River. Oklahoma Pipe Line Constructors, contractor. Spread 1—Louis Visentine, Pasadena, Tex.; Spread 2—Raymond Law, 1100 Old Spanish Trail, Houston.

Brazos River west to Austin, Houston Contracting Co.

Crude-oil-pipe-line mileage on projects has stepped up to a new high for this period.

• **Roosevelt Oil & Refining Corp.** — 22 miles, 4 and 6-in., planned, St. Helens to Norwich, Mich.

• **Service Pipe Line Co.**—16-in., planned, Bowie, Tex., to Drumright, Okla.

30 miles, 6-in., Knox and Haskell counties, Texas.

29 miles, 4-6-8-in., proposed, Natrona County, Wyoming.

170 miles, 12-in., proposed, Tioga to Williston, N. D.

Shell Pipe Line Corp. — 42 miles, 8-in., Halletsville to LaGrange, Tex.

Sinclair Pipe Line Co.—674 miles, 22-24-in., under way, Drumright, Okla., to East Chicago, Ind. Completion date 1952.

Section 1, Drumright-Cushing, Okla., area, to Humboldt, Kans. O. R. Burden Construction Co.

(Spread 1) Caney to Humboldt, Kans. A. B. Haynes, superintendent at Chanute, Kans.

(Spread 2) Cushing, Okla., to Caney, Kans. Floyd Lewis, spreadman at Hominy, Okla.

Humboldt, Kans., to Salisbury, Mo. R. H. Fulton & Co., contractor. M. L. Boyd and Jerry Nash, spreadmen.

Salisbury, Mo., to Forest City, Ill. O. R. Burden, contractor.

Socony-Vacuum Oil Co., Inc.—20 miles, 8-in-10-in., under way, Hutchinson, Kans. Brown-Lite Contractor.

Southern California Edison Co.—41 miles, 8-in., under way, Etiwanda to Santa Fe Springs, Calif. J. E. Young Pipe Line Contractors, Inc. Jack Cook, spreadman. Completion date 10-15-52.

• **Sterling Pipe Line System.**—53 miles, 12-in.. planned, Sterling, Colo., to connection with Platte Pipe Line at Gurley, Neb. (Includes 20 miles, 10-in., main line; 35 miles, 8-in., branch lines). Joint venture comprising Toronto Pipe Line Co., Shell Pipe Line Corp., and Texas Pipe Line Co.

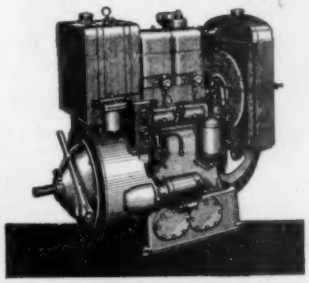
• **Sun Pipe Line Co.**—99 miles, 4-6-8-in., proposed, Scurry County, Texas.

34 miles, 8-in., planned, Jameson to Colorado City, Tex.

20 miles, 8-in., planned, Claytonville to Colorado City, Tex. Completion date 11-1-52.

• **Texas-Empire Pipe Line Co.**—30 miles,

10 REASONS why your next power unit should be a NORDBERG Diesel



1. Expressly developed to meet the need for simple, compact engines of small horsepower.
2. Low initial cost.
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4. Choice of generator, centrifugal pump, stub shaft, or clutch power take-off.
5. Each unit is complete, self-contained, ready to operate.
6. Built to the same exacting standards as the larger Nordberg Diesels.
7. Maximum operating economy—often pays for itself in less than a year.
8. Simple to operate, easy to service, no trained operators necessary.
9. Heavy duty construction throughout for long life.
10. Thermostatically controlled cooling system, heavy duty oil bath air cleaner, fuel and lubricating oil filters and lube oil cooler are all STANDARD on Nordberg units.

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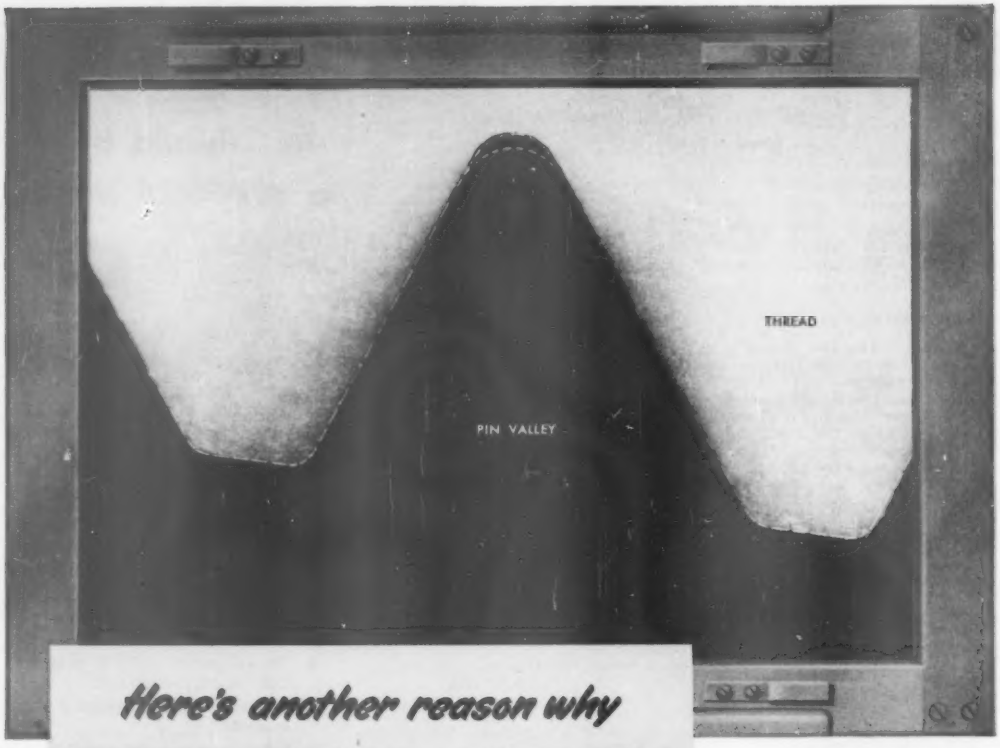
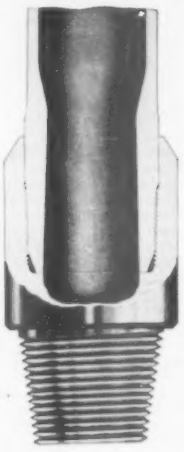


Here's another reason why

REED TOOL JOINTS *last longer*



This photograph of the screen of a thread comparator shows the enlarged profile of a **REED** Tool Joint thread. To an experienced inspector this picture indicates a virtually perfect thread form.

This comparator is just one of many **REED** inspection tools that help make sure the threads on the tool joints you get are absolutely accurate.

Thread accuracy is another important reason why **REED** TOOL JOINTS LAST LONGER!

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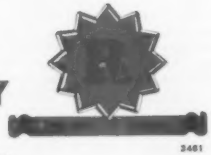

3461

18-in., planned, Wilmington to Lockport, Ill.

Texas Pipe Line Co.—319 miles, 22-12-10-in., under way, Louisiana Gulf Coast to Port Arthur, Tex.

Corsicana to East Houston, Smith Contracting Corp. Frank Craig, spreadman at Teague, Tex. Completion early summer.

Gueydan east to Morgan City, La. Houston Contracting Co. F. A. Silar, superintendent at Abbeville, La.

Houma, La., south through Terrebonne Bay vicinity. Houston Contracting Co. H. L. Leake, superintendent at Houma.

• **Toronto Pipe Line Co.**—100 miles, 6-10-12-in., planned, Merino, Colo., to Gurley, Neb. Completion date 10-31-52.

• **West Coast Pipeline Co.**—986 miles, 20-22-in., planned, Synder, Tex., to Norwalk, Calif.

West Texas Gulf Pipe Line Co.—466 miles, 26-in., under way, Colorado City, Nederland, Tex. Anderson Bros.

(Spread 1) Wortham to Longview, Tex. 10-52. Anderson Bros.

(Spread 2) Glenrose, Tex. Anderson Bros.

(Spread 3) Colorado City to Abilene, Tex. Anderson Bros.

(Spread 4) West of Wortham. Anderson Bros.

(Spread 5) Big Spring to Colorado City. Anderso Bros.

(Spread 6) East of Abilene Associated Pipe Line Contractors.

Products Pipe Lines

• **Bell Oil & Gas Co.**—150 miles, 6-8-in., planned, Ardmore to Drumright, Okla. Completion date 6-1-53.

Buckeye Pipe Line Co.—370 miles, 8-12-16-in., under way, Linden, N. J., via Allentown, Pa., to Auburn, Syracuse, Waterloo, and Rochester, N. Y. (Sections divided as follows: 75 miles, 16-in., 218 miles, 12-in., 77 miles, 8-in.). Completion of 16-in., 1952, balance 1953.

77 miles, 16-in., under way, Macungie, Pa., to Linden, N. J. H. L. Gentry Const. Co. A. J. Brown, spreadman at Coopersburg, Pa. Completion date 10-15-52.

• **Costal Products Pipe Line Co.**—260 miles, 20-in., proposed, Houston to Baton Rouge.

Derby Oil Co.—30 miles, 4-in., under way, Wichita to Bell, Kans.

Gulf Refining Co.—78 miles, 8-in., under way, Port Arthur to Deer Park, Tex.; Glaser Const. Co., Barry Const. Co.

28 miles, 8-in., under way, El Vista to Orange, Vawter Const. Co., I. R. Stewart Const. Co.

In five crude-oil-pipe-line projects alone, which have not yet been contracted, total lengths near 3,000 miles.

• **Harbor Products System (Sinclair).**—89 miles, 16-in., planned, Philadelphia to New York Harbor.

Indiana Farm Bureau Cooperative Association, Inc.—180 miles, 80-in., under way, Mt. Vernon to Indianapolis, Ind. R. B. Potashnick, contractor.

70 miles, 4-in., under way, Indianapolis to Peru, Ind. R. B. Potashnick, contractor.

• **Keystone Pipe Line Co.**—60 miles, 12-in., proposed, Pt. Breeze, Pa., to Montello, Pa. Completion date 12-31-52.

Ohio Oil Co.—255 miles, 8-10-in., East St. Louis, Ill., to Indianapolis. Conyes Const. Completion date 11-52.

• **Phillips Petroleum Co.**—50 miles, 8-in., planned, Goldsmith to Spraberry, Tex. Completion date 11-52.

54 miles, 6-in., planned, Goldsmith to Borger, Tex.

Phillips Pipe Line Co.—35 miles, 6-in., contracted, Okmulgee, Okla., to Tulsa. Smith Contracting Co. Completion date 10-52.

68 miles, 12¾-in., under way. Osawatomie westward to Wichita, Kans. Brown Lite Co. R. E. Carriker, spreadman at Osawatomie, Kans.

40 miles, 10-in., through Monteau, Cole, Osage, and Gasconade counties, Missouri. Trojan Const. Co. E. L. Maggard, spreadman at Linn, Mo.

Under way, Paola, Kans.-Harrisonville, Mo. Smith Construction Corp.

74 miles, 8-in., under way, looping from Decatur, Ill., to East Chicago, Ind. Somerville Const. Co., contractor.

• **Phillips Pipe Line Co.**—137 miles, 10-in., planned, looping from Paola, Kans., to East St. Louis, Ill.

Pioneer Pipe Line Co.—(Continental Pipe Line Co. and Sinclair Pipe Line Co.). 310 miles, 8-in., under way, Sinclair, Wyo., to Salt Lake City, Utah.

• **Progress Pacific Pipe Line Co.**—900 miles, 10-in., proposed, California to West Texas.

Shell Oil Co.—565 miles, 8-14-in., under way, Wood River via East Chicago to Detroit. R. B. Potashnick, contractor on Wood River—E. Chicago portion of project.

• **Sinclair Pipe Line Co.**—8-10-in., planned, Sinco to Port Arthur, Tex.

• **Standard Oil Co. (Ind.).**—316 miles, 12-in., proposed, Sugar Creek refinery to Dubuque, Iowa. Completion date 1-1-53.

• **Standard Oil Co. (Ohio).**—17 miles, 6-in., planned, Toledo to West Toledo, Ohio.

Sun Pipe Line Co.—110 miles, 8-in., under way, Fostoria to Hudson, Ohio.

Tuscarora Oil Co.—74 miles, 6-10-12-in., under way, Allentown to Midland, Pa.

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Reading in barrels per hr., specific gravity, diameters, 2½ to 20-in., pressure—lbs. per 1000 ft.—and all "C" values. Price $7.50 each. Discount for quantities.

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CLEVELAND
TRENCHERS

• **United States Pipe Line Co.**—1,000 miles proposed, Gulf Coast via Memphis, Nashville, Tenn., Lexington, and Paducah, Ky., to Cincinnati, Ohio.

Natural-Gas Pipe Lines

Algonquin Gas Transmission Co.—160 miles, 24-26-in., under way, New Jersey to Connecticut River near New Haven. Williams Brothers, contractor. Robert L. Buck, project manager, Danbury, Conn. Spreadmen: Thelmer Davis, Waterbury, Conn., O. L. Martin, Sloatsburg, N. Y., O. R. Mitchell, Danville, N. J.

270 miles, under way, New Jersey, Connecticut, Rhode Island, and Massachusetts. Completion date 9-1-52.

• **Allied Gas Co.**—24 miles, 6⅝-in., proposed, McLean to Champaign County, Illinois.

• **Arkansas-Missouri Power Co.**—140 miles, 2 to 10-in., planned, St. Francis River, Clay County, Arkansas, to near Campbell, Mo.

• **Associated Natural Gas Co.**—88 miles, Missouri.

Greatest activity in the pipeline business currently is in natural-gas transmission.

• **Carolina Natural Gas Corp.**—185 miles, 2-12-in., proposed, lateral lines off Transcontinental in North and South Carolina.

Cities Service Gas Co.—179 miles, 4-30-in., gathering system in vicinity of Ulysses, Kans. Vaughn & Taylor Construction Co., Inc. D. D. Vaughn, spreadman, Ulysses.

15 miles, 20-in., Craig County, Oklahoma, to Lawrence County, Missouri.

Cities Service Gas Co.—21 miles, 26-in., planned, Franklin and Anderson counties, Kansas.

• **Coast Counties Gas & Electric Co.**—40 miles, 3, 4, and 8-in., planned. Coast and Valley region, California.

Colorado Interstate Gas Co.—250 miles, 20-in., under way, Kit Carson, Colo., to Amarillo, Tex. R .H. Fulton & Co., contractor. Jerry Nash spreadman at Lamar, Colo.

Pueblo County to Fowler, Colo.

• **Commonwealth Natural Gas Corp.**—537 miles, 20-in., proposed, West Bend, Ky., to Norfolk, Va.

Dow Chemical Co.—70 miles, various sizes, Midland, Saginaw, and Bay City, Mich. Mahoney Contracting Co., contractor. Ralph Bucher, spreadman at Midland.

• **East Tennessee Natural Gas Co.**—172 miles, 22-in., planned, Greenbrier to Oak Ridge, Tenn.

100 miles, 16-in., proposed, Knoxville to Kingsport, Tenn.

• **El Paso Natural Gas Co.**—133 miles, 30-in., proposed, looping along main line in Texas, New Mexico, Arizona.

36 miles, 24-in., proposed, looping from Kingman to Franconia, Ariz.

• **Frederick Gas Co.**—26 miles, 4-in., planned, Redlands to Frederick, Md.

• **Georgia Gas Co.**—32 miles, 4½-in., proposed, Bogart to Gainesville, Ga.

• **Glacier Gas Co.**—285 miles, 20-in., proposed, Kalispell, Mont., to Spokane, Wash.

120 miles, 16-in., proposed, Spokane to Hanford, Wash.

91 miles, 8⅝-in., proposed, Spokane to Lewiston, Idaho.

130 miles, 12¾-in., proposed, Spokane to International boundary at Trail, British Columbia.

• **Gulf Interstate Gas Co.**—1,000 miles, 30-in. planned, Gulf Coast to North Kentucky.

• **Home Gas Co.**—32 miles, 12-in., planned, Breesport to Union Center, N. Y.

17 miles, 12-in., proposed, loops from Hancock to Sanford, N. .

• **Hope Natural Gas Co.**—33 miles, 8-10-12-in., planned, Wyoming County, West Virginia, south to Buchanan County, Virginia.

Houston Pipe Line Co.—50 miles, 16-in., under way, Edna to Tom O'Connor. Completion date 9-1-52.

Iowa-Illinois Gas & Electric Co.—41 miles, 10-in., planned, Washington County to Cedar Rapids, Iowa.

Iowa-Illinois Gas & Electric Co.—¾ to 6-in., under way, Davenport, Iowa, and Moline, Ill. C. E. Wilson Const. Co.

• **Kansas-Nebraska Natural Gas Co., Inc.**—179 miles, proposed, Kansas and Nebraska.

20 miles, 16-12-in., planned, Hastings to Grand Island, Neb. Completion date 1952.

18 miles, 6-8-in., planned, McCook, Neb., south. Completion date 1952.

54 miles, 4-6-in., planned, Neligh to Hartington, Neb. Completion date 1953.

49 miles, 10-in., planned, Ogallala to North Platte, Neb. Completion date 1952.

20 miles, 12-in., planned, Atwood to near Oakley, Kans. Completion date 1952.

• **Kansas Power & Light Co.**—27 miles, 20-in., planned, Pratt, Kans., to Calista compressor station.

28 miles, 12-16-in., planned, north of Kansas to Meade County gas field.

• **Lake Shore Pipe Line Co.**—45 miles, 10¾-in., planned, northwesterly from T.G.T. system near Meadville, Pa., to Ashtabula, Ohio. Harford Bros., contractor.

• **Lone Star Gas Co.**—100 miles, proposed, storage fields to the Dallas-Fort Worth area.

35 miles, 12-in., proposed, southeastern Schleicher County.

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70 miles, 20-in., planned, Garvin County, Oklahoma, to Clay County, Texas.

• **Manufacturers Gas Light & Heat Co.**—40 miles, proposed, Allegheny, Washington, and Beaver counties, Pennsylvania.

Michigan Gas Storage Co.—93 miles, 16-22-24-in., under way, Laingsburg to near Pontiac and Mount Clemens, Mich. (Includes 17 miles of lateral lines.) Mahoney Contractor.

• **Michigan Gas Storage Co.**—30 miles, 26-in., planned, looping between Laingsburg and Mount Pleasant Junction, Mich.

Michigan Gas Utilities Co.—77 miles, under way, Sturgis, Hillsdale, and Coldwater, Mich. (22.7 miles, Marshall south to Coldwater; 20 miles, Coldwater easterly to Hillsdale; 22.5 miles, Hillsdale to Sturgis, 11 miles, Hillsdale to Jonesville.) Somerville Const., contractor, Jim Godwin at Coldwater.

• **MidSouth Gas Co.**—240 miles, proposed, Greene, Poinsett, Crittenden, St. Francis, Lee, Phillips, Monroe, Woodruff, and Cross counties, Arkansas.

Minneapolis Light & Power Co.—20 miles, 30-in., under way, Minneapolis, Williams Brothers, contractor. F. W. Caldwell, spreadman.

Natural-gas pipe lining is big business. The projects not yet contracted run into the thousands of miles.

• **Mississippi River Fuel Corp.**—98 miles, 16 and 18-in., planned, feeder line from Lincoln Parish, Louisiana, to Waskom field, Harrison County, Texas.

40 miles, 18-in., planned, Dubach to Perryville, La.

Missouri Central Gas Co.—25 miles, 6-in., contracted, Moberly to Macon, Mo. L. R. Young Const. Co.

• **Montana Power Co.**—52 miles, 16-in., planned, Canada-Montana border to Cut Bank, Mont.

• **Morganfield Natural Gas Co.**—31 miles, 4-6-in., planned, through Sturgis, Providence, Clay, Diamond, Wheatcroft, and Sullivan, Ky.

• **National Utilities Co. of Michigan.**—77 miles, 20-in., proposed, South Central Michigan. (22 miles from near Marshall south to Coldwater; 20 miles east of Hillsdale; 22 miles southwest to Sturgis; 5 miles from Hillsdale to Jonesville and 8 miles west to Union City.)

• **Nevada Natural Gas Pipe Line Co.**—114 miles, 10-in., proposed, Topock, Ariz., to Las Vegas, Nev.

• **New River Gas Co.**—50 miles, planned, Summers to Monroe counties, West Virginia, to Narrows and Dublin, W. Va.

New York State Natural Gas Corp.—104 miles, 14, 16, 20-in., under way, looping on Westmoreland, Armstrong, and Tioga counties, Pennsylvania. (Includes 17 miles, 16-in., in Potter County, Pennsylvania, and 21 miles 14-in., replacement in Line No. 507, New York.)

Utica to Amsterdam, N. Y. (to begin at completion of Zelienople). Williams-Austin. Howard Bauer, superintendent. Completion in 90 days.

Angelica to Rossburg, N. Y. (begin at completion of Cayuta-Ithaca). Williams-Austin. Howard Bauer, superintendent. Completion in 45 days.

Colesburg Junction to Sabinsville, Pa. (begin at completion of Angelica job), Williams-Austin. Howard Bauer, superintendent.

21 miles, Columbiana and Stark counties, Ohio.

• **New York State Natural Gas Co.**—95 miles, 16-20-in., proposed, Clinton County to Armstrong County, Pennsylvania.

(Section 1) 16-in., Clinton County, Pennsylvania.

(Section 2) 20-in., Armstrong County, Pennsylvania, begin 1953.

Niagara Mohawk Power Corp.—55 miles, 10-in., Fulton to Watertown, N. Y.; Williams-Austin Co., contractor. Howard Bauer, superintendent. Completion date 9-52.

20 miles, 10-24-in., under way, Syracuse, N. Y. H. L. Gentry Const. Co., contractor. Bob Cantrell spreadman at Syracuse. Completion date 10-1-52.

Northeastern Gas Transmission Co.—221 miles, 20-24-in. under way, New Hampshire, Massachusetts, and Connecticut, Bethel Corp. Completion date 9-52.

• **Northeastern Gas Co.**—411 miles, proposed, New England towns.

• **Northern Natural Gas Co.**—580 miles, proposed, Kansas, Texas, Oklahoma, and Nebraska loops.

210 miles, 26-in., proposed, five loops in Texas-Oklahoma area, two in Kansas, and two in Nebraska.

400 miles, 24-in., proposed, Emerson, Manitoba south to Red River Valley through Fergus Falls on to St. Paul, Minn.

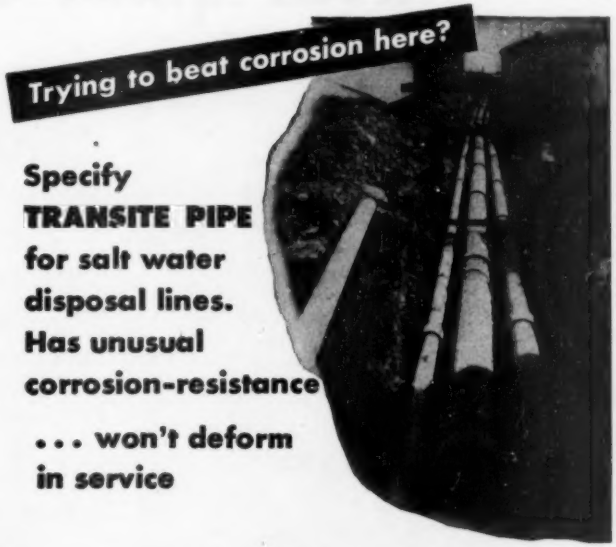
Northern Natural Gas Co.—140 miles, 4-6-8-in., under way, south of Rolla, Kans., to Guymon, Okla. Reese Bros. Const. Co. E. H. Reese, spreadman at Hugoton, Kans.

• **Northern Indiana Fuel & Light Co.**—33 miles, 8-in., proposed, Edgerton to Auburn, Ind.

• **Northwest Natural Gas Co.**—750 miles, planned, Washington, Oregon, and Idaho.

24-in., Eastport, Idaho, to Monroe, Wash.

18-in., Monroe to International boundary near Lynden, Wash.



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But Transite's advantages do not stop there. It is light in weight and easy to handle... most sizes can be unloaded and lowered into the trench without mechanical handling equipment. And Transite's factory-made Simplex Couplings speed assembly... provide tight yet flexible joints that permit laying the pipe around curves without special fittings.

Transite Pipe for salt water disposal lines is made in a full range of sizes. For further information write Johns-Manville, Box 60, New York 16, N. Y.

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Air was to be oil-free.
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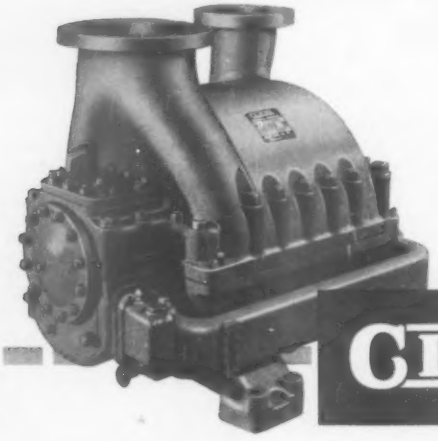
Available floor space was 7 x 11 feet including aisles!
650 horsepower was required.

An analysis proved a centrifugal compressor would be the correct answer, economically and process-wise if the available space was sufficient. Only Clark could handle the problem because only a Clark compressor could *economically* accommodate the pressure rise in one compressor case.

The reason: Only Clark could supply water cooled interstage diaphragms between impellers, thereby reducing costs tremendously.

Clark solved this problem as it can solve your problem, the simplest way, the least costly way, the best way.



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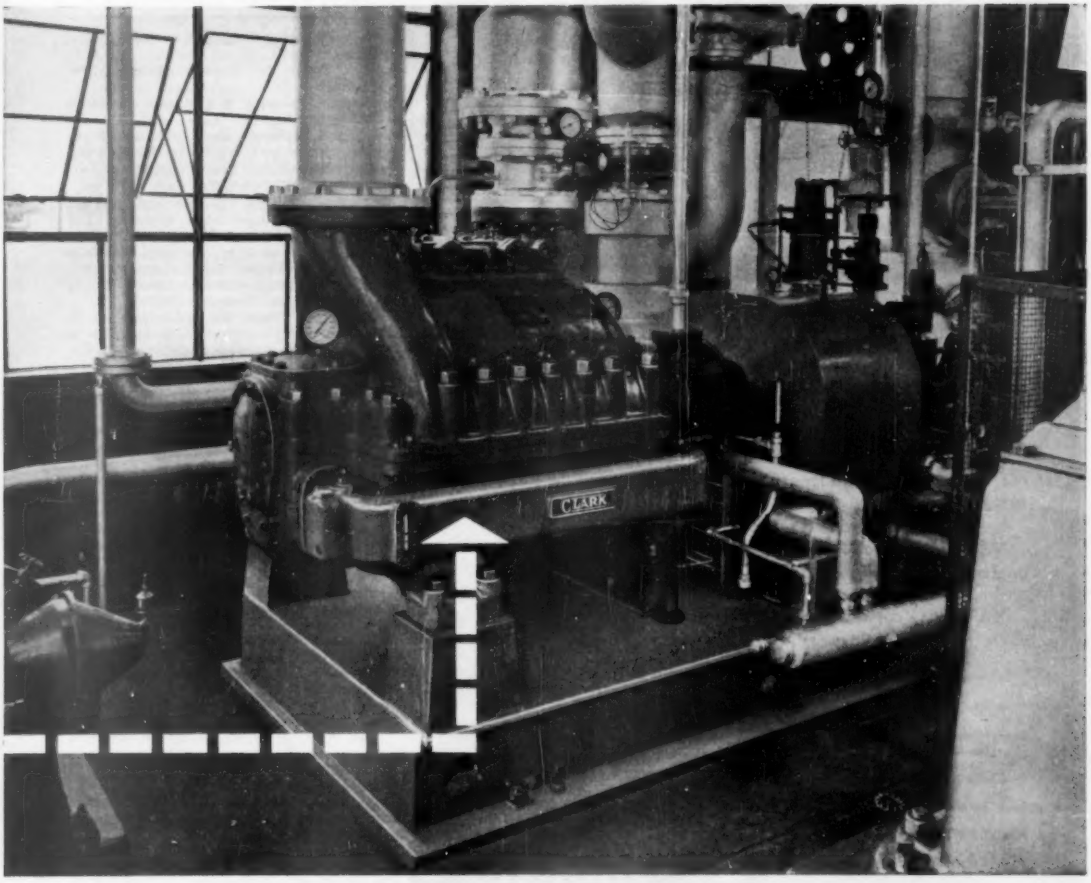
simplifies installation centrifugal compressor



Clark No. 2 Standard Multi-Stage Centrifugal Compressor, non-condensing steam turbine driven, and mounted on a steel base with the turbine for permanent alignment.

22-in., Monroe to near Seattle, Wash.

20-in., Seattle to Portland, Ore.

• **Ohio Fuel Gas Co.**—31 miles, 20-in., planned, Licking County to Richland County, Ohio.

22 miles, 16-in., planned, Dayton, Troy, Piqua, and Sidney, Ohio.

23 miles, 16-20-in., planned, Wellington to Elyria, Ohio; 16 miles, 20-in., planned, Benton Station to Crawford Station; 18 miles, 20-in., Crawford Station to near Columbus; 16 miles, 16-in., planned, Berlin to Sandusky, Ohio.

74 miles, 3 to 20-in., planned, Hocking, Knox, and Ashland counties, Ohio.

47 miles, 20-in., planned, Benton Township, Hocking County, to Columbus, Ohio.

61 miles, planned, northern and southwestern Ohio.

33 miles, 20-in., proposed, Jefferson to Seneca, Ohio.

• **Oklahoma Natural Gas Co.**—51 miles, 12-in., planned, Bethany to El Reno, Okla; Henrietta to Morris; Haskell to Muskogee.

Pacific Gas & Electric Co.—44 miles, 8-in., under way, Salinas to King City, Calif. W. M. Lyles and company crews. Completion date 6-10-52.

• **Pacific Gas & Electric Co.**—50 miles, 12-16-20-in., planned, Fresno to Merced, Calif.

(Section 1) 16-in., Burrel to near Easton, Calif.

(Section 2) 20-in., Holm to Topock-Milpitas line.

(Section 3) 12-in., parallel existing Madera-Livingston line.

141 miles, 34-in., proposed, parallel sections along Topock-Milpitas line.

Planned, Monterey to Fort Ord to Castroville; Napa Wye to Shellville; Cotati to Santa Rosa, Calif.

Panhandle Eastern Pipe Line Co.—70 miles, 24-26-in., under way, looping from Sneed, Tex., to Emporia, Kans.

174 miles, 30 and 26-in., contracted. Tuscola, Ill., eastward—looping present system; R. A. Conyes, contractor.

26-in., Edgerton, Mich., Anderson Brothers.

30-in., looping in Tuscola, Ill.

30-in., looping in Montezuma, Ind.

30-in., looping in Zionsville, Ind.

Pennsylvanian Gas Co.—52 miles, 12-in., between Warren and Erie, Pa. Section 1—27 miles, under way and contracted by Harford Brothers, Section 2—25 miles.

• **Peoples Natural Gas Co.**—25 miles, proposed, Cambria and Blair counties, Pennsylvania.

• **Permian Basin Pipeline Co.**—384 miles, 20-30-in., proposed, Permian basin area to eastern New Mexico.

Transportation of refined products by pipe line is reaching a new peak in importance.

Upton County, Texas, to Lea County, New Mexico.

Lea County to Roosevelt County, New Mexico.

Roosevelt County, New Mexico, to Carson County, Texas.

Phillips Petroleum Co.—250 miles, 30-in., under way, gas gathering system, Midland and Glasscock counties, Texas, Vaughan & Taylor Const. Co. Completion date 10-52.

Phillips Petroleum Co.—200 miles, 2 to 30-in., planned, Midland, Upton, Glasscock, and Regan counties, Texas. Completion date 5-53.

65 miles, 4 to 30-in., planned, Goldsmith field system, Texas. Completion date 1-53.

28 miles, 10-in., planned, Bayou Plant to Adams Terminal. Completion date 7-53.

Piedmont Natural Gas Co.—36 miles, 8-10-12-in., under way, west of Greensboro to Burlington, N. C. Gragg Construction Co. Hubert Gragg, supt., at Greensboro.

• **Public Service Co. of Colorado.**—95 miles, proposed, Douglas Creek and other gas fields to Grand Junction, Colo., area.

• **Public Service Co. of North Carolina.**—83 miles, 8-in., planned, Kings Mountain to Asheville, N. C. Completion date 3-1-53.

• **Rockland Light & Power Co.**—22 miles, 8-in., proposed, Orangetown to Tompkins, Cove, N. Y.

• **Shenandoah Gas Co.**—39 miles, 3-4-8-in., proposed, Middleton, Va., to Martinsburg, W. Va.

• **South Carolina Natural Gas Co.**—160 miles, 16-12-10-in., proposed, Aiken, S. C., to cities of Columbia, Summerville, and Charleston, S. C.

• **South Georgia Natural Gas Co.**—339 miles, 2-12-in., proposed, Florida and Georgia.

• **Southern California Gas Co.**—35 miles, planned, Antelope Valley, California.

• **Southern California Gas Co. and Southern Counties Gas Co. of California.**—45 miles, 30-in., proposed, looping on line from Arizona border to Los Angeles.

81 miles, 30-in., proposed, Whitewater to Desert Center, Calif.

• **Southern Natural Gas Co.**—1,255 miles, 24 to 4½-in., proposed, Louisiana, Mississippi, Alabama, and Georgia.

169 miles, loops, Ouachita Parish, Louisiana, to Augusta, Ga.; 20 miles in Ouachita Parish, 33 miles in Ouachita and West Carroll parishes; 7 miles, Sharkey County, Mississippi; and 108 miles, 14-in., Bass Junction to Augusta, Ga.

• **Southern Union Gas Co.**—21 miles, 20-in., planned, Albuquerque, N. M.

27 miles, 10-in., planned, Lea and Eddy counties, New Mexico.

Corrosion—AN ALLY OF THE ENEMY

CORROSION — the great saboteur — works night and day making old storage tanks useless and necessitating costly repairs to new. In some sour crude areas, new tanks have been rendered useless in as little as 18 months.

Now, with steel again in short supply, you will have to get the maximum years of life from each tank so there may be more steel for defense.

NATASCO products will prevent corrosion from getting a start on your new tanks and prevent further corrosion on old ones.

NATASCO corrosion prevention products have been proved by years of successful use. NATASCO also provides experienced crews for the preparation and application of these products.

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Odessa, Texas

California Representative:
Coast Contractors, Inc.
2627 Atlantic Ave.
Long Beach 6, Calif.

New England Representative:
The McKin Company
P. O. Box 711
Portland, Maine

Southern Union Gas Co.—30 miles, 12-20-in., contracted, San Juan County, New Mexico. R. H. Fulton & Co.

• **Southwest Gas Corp., Ltd.**—26 miles, proposed, from P.G.&E. line to Victorville, Calif.

• **Tennessee Gas Transmission Co.**—591 miles, 24-30-in., proposed, looping along present system (consisting of 323 miles of 30-in.; 167 miles of 26-in.; 101 miles of 24-in.)

420 miles, 30-in., Texas, Louisiana, Arkansas, Mississippi, Tennessee, and Kentucky.

101 miles, 26-in., Kentucky and Ohio.

304 miles, 24-in., proposed, Mercer, Pa., to Utica, N. Y.

202 miles, 20-26-30-in., proposed, Buffalo to Canada.

Tennessee Gas Transmission Co. — 116 miles, 30-in., under way; three loops, from Refugio to Cleveland, Tex.; Oklahoma Pipe Line Constructors. Ed Flanagan, Victoria, Tex.

80 miles, 26-in., contracted, Harrison County to Jackson County, Ohio. H. C. Price & Co., contractor.

(Spread 1—Carrollton, Ohio, southwestward to Harrison County, Ohio. H. C. Price Co., contractor.

(Spread 2)—Athens, Ohio, to Jackson County, Ohio. H. C. Price Co., contractor.

126 miles, 30-in., under way, Arkansas, Louisiana, and East Texas. Houston Contracting Co.

(Spread 1) Gallion, La. Houston Contracting. W. H. Hayes, superintendent, M. L. Thompson, assistant superintendent.

(Spread 2) Eros, La., to Coldwater, La. Houston Contracting. F. A. Silar, superintendent.

(Spread 3) Sabine River south to Jasper Compressor Station. Houston Contracting. E. C. Norris, superintendent. R. E. Thornton, assistant superintendent.

(Spread 2) Under way, Marshall County to Tippah County, Mississippi. 9-10-52.

Texas Eastern Transmission Corp.—791 miles, 30-in., under way, Kosciusko, Miss., to Connellsville, Pa.

(Section 8) Portsmouth to Amesville, Ohio. Anderson Brothers Corp.

(Section 9) Amesville to Ohio-West Virginia river crossing. Anderson Brothers Corp.

(Section 10) Ohio River to Connellsville, Pa. Anderson Brothers Corp.

43 miles, 30-in., under way, Wheeling, W. Va. Brown & Root, and H. C. Price Co.

• **Texas Eastern Transmission Corp.** — 315 miles, 24-in., proposed, Provident City, Tex., to Castor, La.

• **Texas Gas Transmission Corp.** — 408 miles, 26-in., planned, looping from Bastrop, La., to Hardinsburg, Ky.

180 miles, 26-in., Acadia Parish to connection with existing facilities in Morehouse Parish.

35 miles, 12-in., Slaughters, Ky., to Evansville, Ind.

195 miles, 26-in., proposed, Gulf Coast region to southwestern Louisiana.

560 miles, 26-in., proposed, Louisiana and Kentucky.

Texas Gas Transmission Corp.—Under way, Mississippi River near Greenville, Mississippi to Jeffersontown Station, Ky. H. C. Price Co. Charlie Ice, supt., at Cleveland, Miss. Completion date 11-15-52.

26-in., under way, Bastrop, La., to north of Mississippi River. W. H. Hayes, superintendent. Houston Contracting.

• **Texas-Ohio Gas Co.**—1,350 miles, 30-in., proposed, Hidalgo County, Texas, through Arkansas, Mississippi, Tennessee, and Kentucky on to Spencer, W. Va. Completion date 6-30-53.

• **Union Oil Co. of California.**—40 miles,

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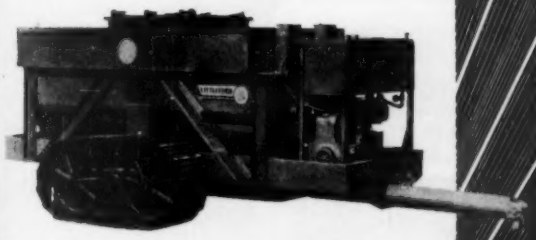
PIPELINE

KETTLES



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8-10-in., planned, San Joaquin Valley and Los Angeles basin.

United Gas Pipe Line Corp.—70 miles, 30-in., under way, Houston to So. Bank of Trinity River, Tex., Louis Visentine, Conroe, Tex.

510 miles, 20 to 30-in., under way, Agua Dulce, Tex., to Monroe, La. River Const. Corp,. contractor.

(Spread 1) 30-in., from Pearl River north and south of Jackson, Miss. Red Tatum, superintendent at Jackson.

(Spread 2) 30-in., McComb to Pearl River south of Jackson. Merle Tatom, superintendent at Hazelhurst.

(Spread 3) 30-in., Kosciusko south, toward Jackson. Jimmy Reed, superintendent at Kosciusko.

(Spread 4) 12-in., Lafayette to Jeanerette, La. Roy Earnhart, spreadman at Jeanerette.

124 miles, Sterlington compressor station, near Monroe to Jackson, Miss.

23 miles, 8-12-16-in., South Louisiana facilities.

All contracted by River Const. Corp., a joint venture including Oklahoma Contracting Co.; J. Ray McDermott & Co., Inc., and Morrison-Knudson. Inspection by Brown & Root, Inc.

• **United Gas Pipe Line Co.**—53 miles, 24-in., planned, Texas.

36 miles, proposed, offshore from Ingleside to near Refugio, Tex.

• **United Gas Pipe Line Co.**—31 miles, 20-in., planned, Ship Shoals to Terrebonne Parish, Louisiana.

Virginia Natural Gas Co.—153 miles Buckingham to Richmond and Portsmouth, Va.

Westcoast Transmission Co., Ltd. — (See foreign natural gas pipe lines).

Western Kentucky Gas Co.—2 to 4-in., under way, additions to present system; Modern Welding Co., Inc., contractor.

• **Western Pipe Lines.**—1,200 miles, 22-in., planned, southern Alberta to Duluth, Minn.

• **Wilcox Trend Pipe Line Co.** (Harry Bass Drig. Co.)—150 miles, various up to 20-in., planned, gathering system for delivery to proposed Texas Eastern terminal at Provident City, Tex.

Foreign Crude-Oil Pipe Lines

• **Alberta-Vancouver Oil Pipe Line Co.**—(Brokaw, Dixon, McKee).—972 miles, 16-in., proposed, Edmonton via Pincher Creek, Alta., Idaho and Washington states to Vancouver, B. C.

• **Basrah Petroleum Co.**—72 miles, 24-in., planned, Zubair to Fao. Begin May 1953.

• **Cia. de Petroleo Ganso Azul, Ltd.**—48 miles, 4-in., planned, Ganzo Azul field to Pucalpa on upper Ucayali River, Peru.

Today's products-line projects still to be contracted are nearing a total of 2,000 miles.

Condor.—90 miles, 12-in., under way, Genoa to Rho, near Milan, Italy. Soc. Ital. Condotte Acqua Montubi, contractor. Completion date 9-52.

Creole Petroleum Corp.—143 miles, 26-in., under way, Ule (State of Zulia) to Amuay (State of Falcon). Williams Bros. de Venezuela, S. A., contractor of overland sections. Charles Williams, manager; Marvin Jones, general superintendent, Maracaibo. McWilliams, Gahagan, and Anderson Brothers, contractors of water crossings. Completion date March 1953.

• **Creole Petroleum Corp.**—25 miles, 34-in., planned, Lagunillas to La Salina (State of Zulia). Completion date April 1953.

Direccion General de Yacimientos Petroliferos Fiscales.—409 miles, under way, Plaza Huincul to Bahia Blanca, Argentina.

Interprovincial Pipe Line Co.—100 miles, 16-in., contracted, Regina, Sask., to Gretna, Man., Canada. Anderson International Contractors, Ltd.

Iraq Government.—135 miles, 12-in., from Iraq Petroleum Co. at Baija to Baghdad, Iraq. Construction 1952. M. W. Kellogg, contractor.

• **Mene Grande Oil Co.**—12 miles, 26-in., Anaco to Puerto La Cruz.

• **Middle East Pipelines, Ltd.**—800 miles, 34-35-in., planned, Iran to a Levantine port.

• **Petroleos Mexicanos.**—145 miles, 12-in., considered, 18 de Marzo field via Reynosa to Monterrey, Mexico.

100 miles, planned, Isthmus of Tehuantepec, Jose Colomo to El Plan field, Minatitlan.

• **Saskatoon Pipe Line, Ltd.** — 56 miles, 6-in., planned, Milden to Saskatoon, Sask.

Texas Petroleum Co.—60 miles, 4-6-in., under way, Pta. Nino to La Dorada.

Trans Mountain Oil Pipeline Co.—711 miles, 24-in., under way, Edmonton, Alta., to Vancouver, B. C. Canadian Bechtel, Ltd., engineers.

(Spread 1) Acheson to Lake Yellowhead. Comstock Midwestern.

(Spread 2) Lake Yellowhead to Blue River Comstock Midwestern.

(Spread 3) Vicinity of Vavenby, Mannix, Ltd.

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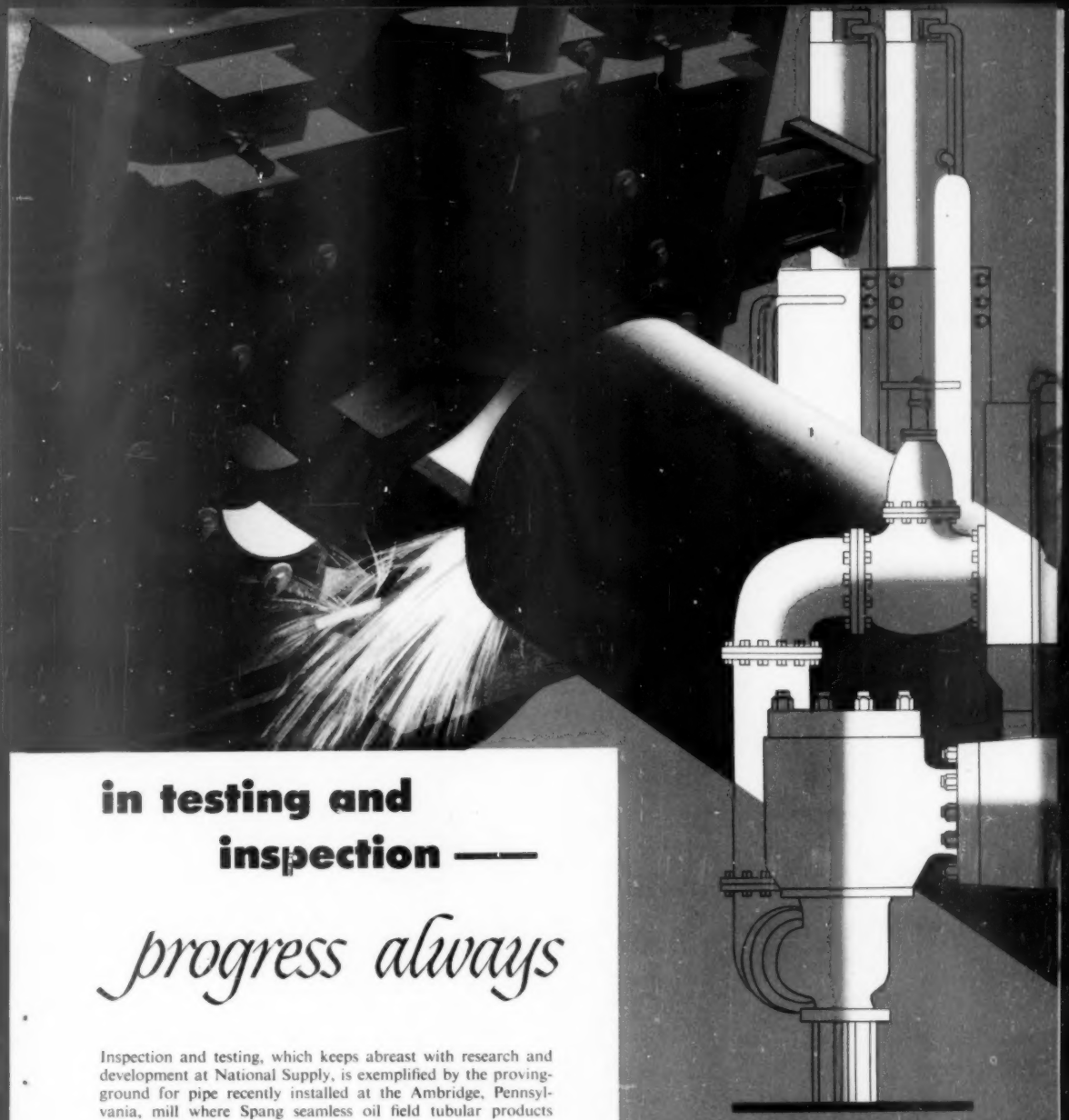

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Inspection and testing, which keeps abreast with research and development at National Supply, is exemplified by the proving-ground for pipe recently installed at the Ambridge, Pennsylvania, mill where Spang seamless oil field tubular products are manufactured.

A pioneer in the manufacture of drill pipe, casing, and tubing, Spang is also a pioneer in the improvement of these products by continuous testing and inspection as a part of the research and development program. On the new high pressure test bench, oil country tubular goods can be subjected to pressures up to 10,000 pounds per square inch, at customer request, to determine the ability of the pipe to withstand high stresses and high pressures.

Yet this hydrostatic testing equipment, representing an investment of over a half-million dollars, is only one link in the long chain of inspection which protects the purchaser of National Supply products.

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General Sales Offices: Pittsburgh 30, Pa.

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Spang Extreme Line Casing is a typical example of product improvement which results from research and testing—in this instance, on oil country casing of the conventional type.

Although it now has a long and successful history Spang Extreme Line Casing was developed, after long field and laboratory study, to meet the requirements of deep wells.

Under these severe and variable conditions of deep-well completion, Spang Extreme Line Casing meets every requirement because it has the mechanical and metallurgical strength to withstand high tensile loading and resist extreme pressure.

There are seven major reasons why it pays to use precision-manufactured Spang Extreme Line Casing for the really tough jobs.

- **High joint strength**
- **Positive fluid seals**
- **Maximum running-in efficiency**
- **Minimum outside joint diameter**
- **Streamlined exterior contour**
- **Smooth bore**
- **Integral joints which eliminate half the threaded connections**

Spang-Chalfant representatives will be glad to discuss specific problems on the application of Spang Extreme Line Casing.

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Spangweld Drill Pipe is another quality product resulting from the constant study and continuous testing of oil country tubular goods at Spang-Chalfant.

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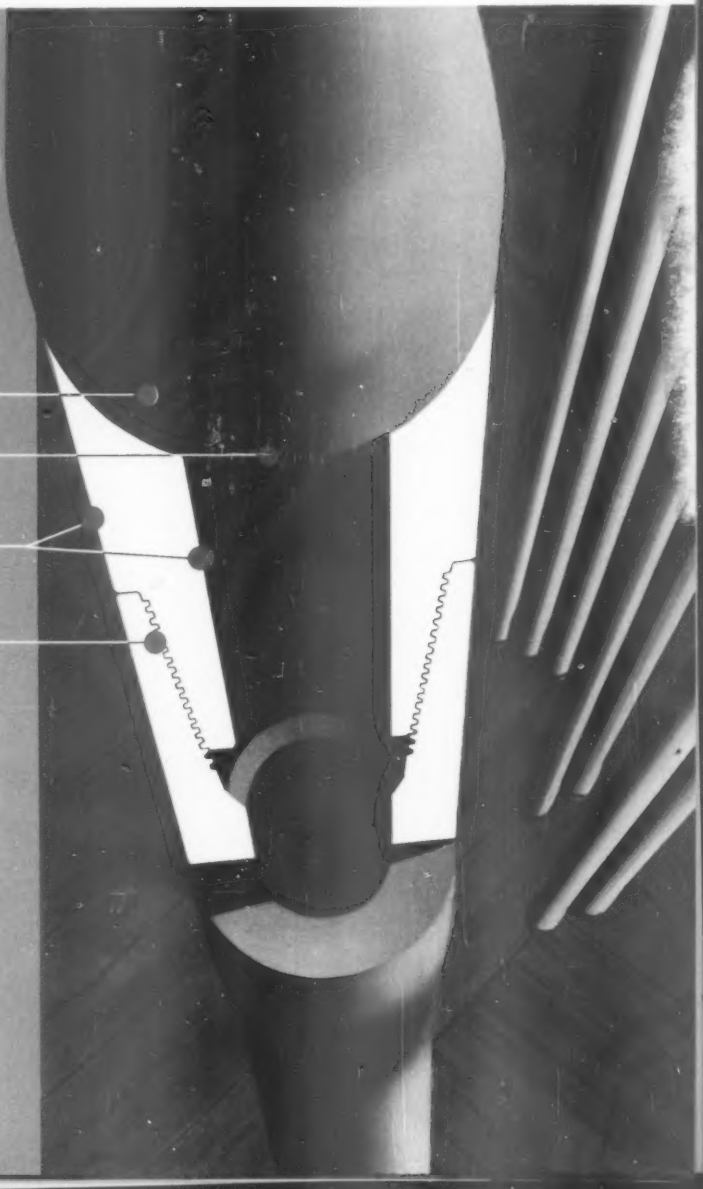

For detailed information on the use of Spangweld Drill Pipe, ask at the nearby National Supply Store or write Pittsburgh.

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NATIONAL BLUE PRODUCTS

PIPE LINES

Three Firms to Lay Chicago-Detroit Products Carrier

NEW YORK.—Construction of a new products pipe line designated the Wolverine system, from Chicago to the Detroit and Toledo areas will be undertaken of Shell, Texas, and Cities Service interests.

The system would comprise more than 200 miles of pipe and consist principally of a 14-in. main line.

Management is directed from the New York office of Shell Oil Co.

Shell's Wood River - Chicago line, now under construction by R. B. Potashnick, is not part of the Wolverine system but is an individual undertaking by Shell to replace an old line with a new one of larger-diameter pipe.

Initial Work Begins on New "Harbor" Products Carrier

PHILADELPHIA. — Sinclair Pipe Line Co. is pushing surveying and right-of-way work for the "Harbor Pipeline," a new big-inch products carrier from Woodbury Junction in the Philadelphia refinery area to Trembley Point, N. J.

The 86-mile, 16-in. line will be owned by Sinclair, Gulf Oil Corp., and The Texas Co., if talks now under way pan out. It will be built and operated by Sinclair Pipe Line. Now scheduled for completion late next year, the new line will carry light-oil products from refineries of the three companies in this area to tidewater at Trembley Point. There it will connect with the new Buckeye Pipe Line, which will carry products of about a dozen companies to northern New York and the Great Lakes region.

The Harbor line will have an initial capacity of 100,000 bbl. of products daily. This will reach 200,000 bbl. eventually. Its completion will eliminate the costly tanker trip up the Delaware River from the Philadelphia refinery docks and assure all-weather operation. The link with Buckeye is anticipated to improve the three companies' competitive positions in the Great Lakes and northern New York areas.

South Georgia Completing Plans For New Gas System

BIRMINGHAM. — South Georgia Natural Gas Co. is rapidly rounding out its plans for laying a 339-mile natural-gas system next year.

Provided the Federal Power Commission approves the project *(The Oil and Gas Journal, March 31, page 138)*, contracts for the entire line will be awarded about January 1.

PAD approval has been granted for delivery of 20,000 tons of steel beginning the second quarter of 1953.

The project will consist of a main line from Phoenix, Ala., to Tallahassee, Fla., with lateral connections to 23 cities. The Phoenix to Albany, Ga., section will be 12-in., the Albany-Moultrie, Gas, section, 10-in., and the remainder to Tallahassee, 8-in. Lateral lines will range down to 3½-in.

Southern Natural Gas Co. is reported to have agreed to make available 19,500,000 cu. ft. for the South Georgia system.

South Georgia Natural is headed by W. B. Perry, president. J. W. Goodwin is executive vice president and consulting engineer. For the present company affairs are handled from the office of J. W. Goodwin Engineering Co., 2111 Seventh Ave., Birmingham. The company has been financed by five Birmingham investors. It has no financial connection with any other pipe line or utility organization.

U. S. Pipe Line Enlarges Plans For Products Carrier

NEW YORK.—United States Pipe Line Co. has filed revised engineering plans with the Petroleum Administration for Defense for a much larger products pipe-line system than it originally planned from the Gulf Coast refining area to the East Coast.

New specifications call for a 1,600-mile system from Port Neches, Tex., to Newark, N. J., with an initial capacity of about 300,000 bbl. daily of light-oil products and L.P.G.

Ultimately the line would carry 400,000 bbl. daily with 350,000 bbl. reaching the Newark terminal.

The system would include a 560-mile, 24-in. section from Port Neches to Jackson, Tenn., and two branches—a 120-mile, 14-in. lateral to Paducah, Ky., and a 1,045-mile, 22-in. main to Newark.

Initially there would be 10 pump stations along the system with 9 others to be added as volume warrants, officials said.

The company recently negotiated a contract with CRC Engineering Services, Houston, for all engineering and

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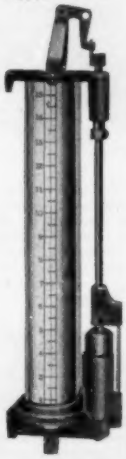

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design work and procurement of materials for the line *(The Oil and Gas Journal, August 18, page 182).*

West Texas Gulf Filling Segments of Big Crude Line

HOUSTON.—Filling and testing are being carried out on 318 miles of the 466-mile, 26-in. main line of the West Texas Gulf crude line.

The completed portions of the line run from Colorado City, the West Texas terminal, due east toward Wortham in Freestone County, East Texas.

Completion date for the entire line from West Texas to the Gulf has been moved back from October 1 to around January 1, 1953, due to delays caused by the steel strike in procuring materials. F. C. Anderson of Gulf, builder and operators of the line for itself and several other companies, said the constructors never ran completely out of steel, but they were forced to drop to one spreading crew from the usual two or three.

He added that normal deliveries of two sizes of pipe have been resumed, but adequate deliveries of the third size of pipe appear to be 30 to 60 days away. Materials for construction of pump stations have been delayed more.

Construction also is going ahead on the 114-mile, 20-in. branch from Wortham to Longview in East Texas.

Northern Natural Firming Up Big Construction Program

WASHINGTON.—Northern Natural Gas Co., Omaha, has filed an application with the Federal Power Commission for permission to construct an estimated $11,692,000 in pipe-line facilities in the Southwest and Midwest.

The project is a portion of the large expansion program authorized by FPC for Northern June 24.

The application was filed in compliance with a condition in the June 24 order requiring the company to apply for the construction of the above facilities which the company had contended did not require commission authorization.

The project involves construction of about 102 miles of pipe line and about 14,520 hp. at compressor stations plus measuring stations and other miscellaneous facilities.

The permit issued in June concerned facilities which will increase the company's system capacity from the existing 600,000,000 to 825,000,000 cu. ft. of gas daily. They include a total of 213 miles of lines and about 100,160 hp. in compressor additions.

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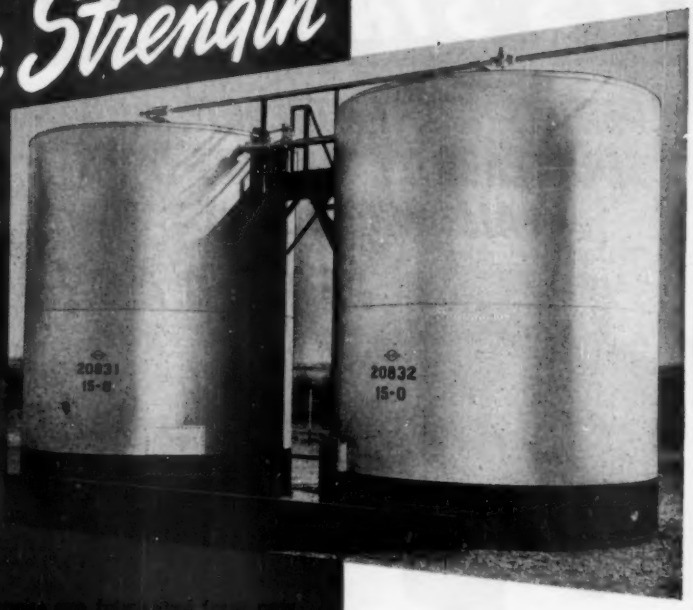

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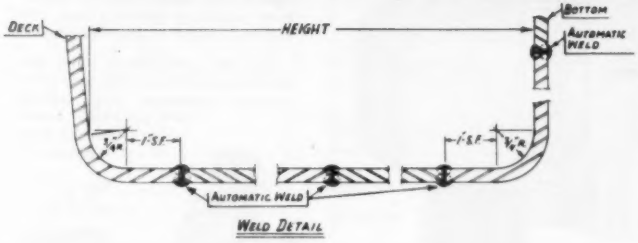

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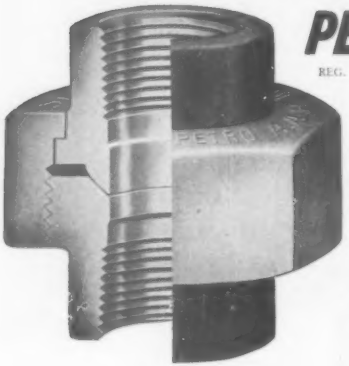

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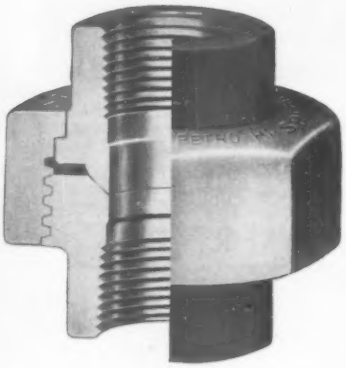

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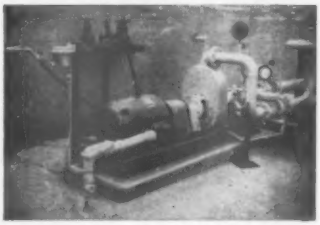

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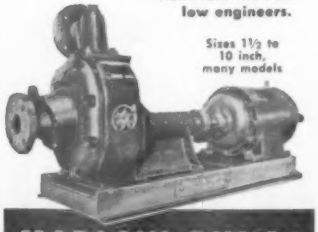

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NATURAL GAS

Rush for Reserves

Firm to spend $40,000,000 for San Juan, Uinta supply

HOUSTON. — Plans to spend $40,000,000 during the next 8 years to develop reserves of natural gas in the San Juan and Uinta basins were disclosed last week by Pacific Northwest Pipeline Corp. of this city in a revamped pipe-line proposal submitted to the Federal Power Commission last week.

Earlier, the company made two applications to serve Pacific Northwest markets, and both plans were abandoned. Neither plan proposed utilization of a gas supply from the San Juan basin.

Pacific Northwest's latest proposal involves laying a 1,300-mile, natural-gas-transmission line to Oregon and Washington at a cost of $130,000,000. The line initially will move 200,000,000 cu. ft. per day. Deliveries would be stepped up to 300,000,000 cu. ft. in the third year of operation, and 750,000,000 after 8 years.

Gas supply . . . To develop this gas supply, Pacific Northwest has made conditional contracts and agreements covering 300,000 acres of potential reserves located in the San Juan basin, which consulting geologists estimate contain 3,6 trillion cubic feet of recoverable gas.

To provide for initial market requirements, Pacific Northwest plans to drill 200 gas wells during the next 18 months in the San Juan basin. The entire 8-year program calls for the drilling of a total of 600 wells.

The principal agreement, covering 180,000 acres, has been closed with Phillips Petroleum Co., subject to FPC approval of the pipe line. Other agreements have been signed with Ralph A. Johnston, Houston, for 17,500 acres; Johnston and R. E. Beaman, Houston, 9,000 acres; Greenbriar Oil Co., Fort Worth, 16,000 acres; and John R. Sharp, Tulsa, 5,647 acres.

Alternative plans . . . Two plans have been placed before acreage holders by Pacific Northwest. The generally accepted plan provides for payment by Pacific Northwest, on FPC approval of the pipe line, of $80,000 for each Mesaverde gas well and $20,000 for each Pictured Cliffs gasser.

Pacific Northwest would develop the acreage during the next 8 years to the Mesaverde objective. Seller reserves the following overriding royalty: 5.5 cents per M.c.f. on gas produced during the first 3⅓ years after completion of pipe line; 6.5 cents during the next 3⅓ years; 7.5 cents the next 3⅓ years; 8 cents in the eleventh year; 9 cents during the twelfth year, and not less than 10 cents thereafter.

Seller also would reserve all crude oil produced from the lease and an overriding royalty of all liquid hydrocarbons recovered from the royalty gas.

The alternative plan offered to acreage holders calls for purchase of the gas at the well head at a minimum price of 10 cents per M.c.f. on a 20-year contractual basis. However, this plan would make it necessary for the seller to do his own drilling.

Line route . . . Pacific Northwest pipe line would originate in the San Juan basin south of Durango, Colo., and would extend across Utah to Salt Lake City, follow the Snake River Valley of Idaho, and enter northeastern Oregon.

At Pendleton, Ore., the line divides, one branch following the Columbia River to Portland and then up the Pacific Coast to Seattle and Bellingham, Wash., the other branch connecting Pasco and Spokane, Wash. The line may be extended to serve Yakima and Wenatchee at a later date.

From the San Juan basin to Salt Lake City, the line will be 26-in. From Salt Lake City to Pendleton, 24-in. pipe will be used. Branch lines from Pendleton will be of various sizes ranging from 6 to 22-in.

The company plans to market gas at points along the line including Boise and Pocatello, Idaho.

Natural Gasoline

Repair Work Under Way on Quake-Damaged Plant

BAKERSFIELD, Calif.—The job of rebuilding portions of the Paloma Unit natural-gasoline plant, which were destroyed by fire following last month's earthquake, has been started.

Actual construction or erection of new facilities probably will not be started for months, but the cleaning-up phase is well advanced. Extent of damage still has not been determined but it is thought that it will exceed $1,500,000.

Among the facilities listed as beyond repair were the four butane spheres, two cooling towers, and portions of the jacket-water cooling and gas-compressor buildings. Extensive damage also was done to other equipment in the newer part of the enlarged gas-cycling plant. C. F. Braun & Co. has been awarded contract for the rebuilding.

According to officials of Western Gulf Oil Co., operator of the Paloma Unit, black-oil production currently is about 3,500 bbl. daily. Before the quake hit, the field's output was 6,900 bbl. daily.

Four Phillips Projects Get DPA Approval for Tax Aid

WASHINGTON.—Four natural-gasoline projects involving expenditures by Phillips Petroleum Co. of almost $21,400,000 have been approved by the Defense Production Administration for accelerated amortization.

The two largest were an $11,452,900 project at Sweeny, Tex., and a $9,096,480 venture in Midland, Upton, and Regan counties, Texas.

The former was granted certificates for quick writeoff of 65 per cent of $4,427,550, 50 per cent of $2,828,700, 40 per cent of $4,427,500, and 15 per cent of $39,100. The latter received certificates for 65 per cent of $6,108,280, 40 per cent of $2,710,000, and 25 per cent of $278,300.

Other projects were at Judkins, Tex., 65 per cent of $30,455, 40 per cent of $28,025, and 15 per cent of $6,520; and in Midland County, Texas, for 65 and 40 per cent of a tentative $778,240—to be revised upon determination of the cost of certain facilities.

Kerr-McGee to Build New Plant in Texas Panhandle

DUMAS, Tex.—Kerr-McGee Oil Industries, Inc., will start construction about October 1 of an $850,000 natural-gasoline plant on a 10-acre site in the Texas Panhandle about 10 miles from here.

The plant will process about 55,000,000 cu. ft. of gas daily and will have an estimated output of 50,000 gal. of gas liquids daily.

Dean A. McGee, executive vice president of the firm, said the plant should be in operation early next year, unless materials delays are encountered. Contract for construction has been let to Dresser Engineering Co., Tulsa.

Products will be extracted from gas produced in Moore and Sherman counties.

The company now has three natural-gasoline plants in Oklahoma. They are at Happy Valley, Milfay, and Fittstown.

Globe Jet Rock Bits are made in types SS2C, S2C, M2C, MH2C, and H2C in all popular sizes from 8½" to 15". Jet Nozzles of Tungsten Carbide are available in 9/16", 5/8", 11/16" and 3/4" diameters.

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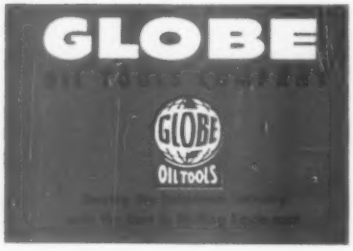

Among the

Drilling Contractors

Drilling At Lowest Level Since April 1951

The effects of the recent steel strike bit sharply into the number of active rotary rigs operating in the United States and western Canada last week. The number of active rotary rigs dropped to the lowest level since April 23, 1951, when 2,467 active rigs were reported. In the United States active rigs declined to the lowest level since April 16, 1951. Active rotary rigs numbered 2,303 for the week ended April 16, 1951.

Active rigs at the close of the week ended August 18 totaled only 2,478, 403 less than a year ago, 57 less than a week ago. The Gulf Coast, North and West Texas, New Mexico, the Ark-La-Tex area, Illinois and Eastern and Rocky Mountain areas all suffered losses. Oklahoma, Kansas and the Pacific Coast reported slight increases.

ACTIVE ROTARY RIGS*
(United States and Western Canada)

Area—	Week ended 8-18-52	Change week ended 8-11-52	Change week ended 8-20-51
Gulf Coast	512	−12	− 77
N. & W. Tex.-N. M.	732	−13	−228
Ark.-N. La.-E. Tex.	122	− 8	− 33
Oklahoma	294	+ 5	− 42
Kansas-S. Nebraska	144	+ 5	− 41
Illinois-Eastern	133	−16	− 23
Rocky Mountains	225	− 5	+ 44
Pacific Coast	157	+ 2	− 25
Total U. S.	2,319	−42	−425
Western Canada	159	−15	+ 22
Total	2,478	−57	−403

*Courtesy Hughes Tool Co. Trends in drilling activity in the United States and the North and West Texas-New Mexico and Oklahoma-Kansas areas are shown on pages 216 and 217.

Gardner Brothers Drilling Co., Dallas, is the contractor on a wildcat test, 1 Not-Ti-Nus-Wood, which Magnolia Petroleum Co. is drilling in the N½ SW SW 1-24n-9w, San Juan County, northwestern New Mexico.

Dirickson-Lewis Drilling Co., Tulsa, is starting two new Oklahoma wildcat tests, one in northwestern Okfuskee County, and the other in southern Pawnee County. Both are being drilled for D. & L. Oil Co., an affiliated company. The former, 1 Crain, is in the SW NW NE 8-13n-7e, 4 miles west of the Micawber townsite and a mile west of the Pettiquah pool. It is contracted to 3,100 ft. The other, 1 Olinghouse, is in the SE SE NW 31-20n-5e, 11 miles south of Pawnee and 1¾ miles west of the Garr area. It will go to 4,000 ft.

Newton Barrett Drilling Co., Shawnee, Okla., is drilling for Helmerich & Payne, Inc., Tulsa, at a wildcat location southwest of gas production in the Perry district, 3½ miles southwest of Perry, Noble County, Oklahoma. The test is on the Schurkens lease in the NE SE SW 5-20n-1w.

Peterson Drilling Co., Shreveport, has a rig working for Kemp Drilling Co., also of Shreveport, at a wildcat location, 1 Boutwell, ½ mile northeast of Ellisville Junction, Jones County, Mississippi. Hole will be carried to the Eutaw, expected around 7,100 ft. Location is in 10-7n-11w.

J. F. Crow Well Servicing Co., Brookhaven, Miss., has the contract for a 3,500-ft. Gas Rock test which J. E. Stack of Meridian, Miss., is starting a half mile west of Madison Station, Madison County, Mississippi. Location is for 1 Crawford, C NW SE 7-7n-2e.

McDowell & Cook will drill a 4,000-ft. well for McAlester Fuel Co. of Magnolia, Ark., at a semiwildcat location south of the old Elm Grove field, 2½ miles southeast of Elm Grove, Bossier Parish, Louisiana. Test is 1-A Hodges, in 32-16n-11w.

Deep Fork Drilling Co., Bristow, Okla., has taken on a 5,000-ft. contract with Wilcox Oil Co. for a wildcat test, 1 Thompson, to be drilled in northwestern Payne County, Oklahoma. Location, in the NW SE NW 33-20n-2e, is 3½ miles northeast of the West Stillwater pool.

Brinkerhoff Drilling Co., Casper, Wyo., has contracted with The Texas Co. for a wildcat test on the Horn Fault prospect in Johnson County, Wyoming. Location is for 1 Evey, in the NE SE SW 3-45n-83w.

Penrod Drilling Co., Shreveport, has a new 11,500-ft. operation under way for Seaboard Oil Co. of Delaware at a wildcat location 4½ miles east of Kateland, southwestern Grant Parish, Loui-

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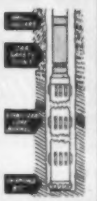

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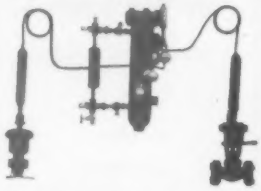

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siana. Spot location is for 1 Shorter, in 40-6n-2w. Objective is the Tuscaloosa sand, nearest production in which is nearly 30 miles distant in the Big Island field, Rapides Parish.

Fortenberry Drilling Co., Natchez, Miss., has contracted for a 5,500-ft. wildcat test to be drilled in Winston County, in Central Mississippi. The test, 1 Fair, located in 27-14n-14e, 2 miles northeast of Fearn Springs, will be drilled for A. P. Flannes and J. C. Steinmetz, acting as trustees.

Sunnyland Contracting Co., Rayne, La., is the contractor on a 5,500-ft. wildcat test being undertaken by J. E. Treadway and D. C. Latimer at 1 Unger-Darnell, in 6-15n-1e, ½ mile northwest of Tehula, in Holmes County, Central Mississippi.

Al Buchanan Drilling Co., San Antonio, is working on an 11,500-ft. contract with Standard Oil Co. of Texas at a wildcat test, 1 M. V. A. Smith, in Dawson County, West Texas. It also has a 7,000-ft. test drilling for Plymouth Oil Co. at G-21 Welder, a wildcat in San Patricio County, in the lower Texas Gulf Coast region.

Noble Drilling Co., Tulsa, has contracts for two additional wildcat tests for California Co. in southeastern Louisiana, both in Plaquemines Parish. The first, projected to 9,000 ft., is 2 Orleans Levee District, in 26-18s-15e. The other, scheduled for 11,000 ft., is 1 State 2011, an off-short job.

Wise Drilling Co. has taken over the contract on Cities Service Oil Co. 1 Wright, Jr., a wildcat test in the Jose M. Garcia Survey, 1½ miles southwest of Crow, Smith County, East Texas, and will deepen the hole from its present total depth of 6,900 ft.

Peterson Drilling Co., Shreveport, has moved a rig to a stepout location ½ mile north of the North Kingston field, Adams County, Mississippi, where it will drill for C. C. Davis. Location is for 1 Sojourner. Location is in 12-5n-2w. Hole is projected to 6,850 ft.

C. & L. Drilling Co., Ada, Okla., contracting for Portable Drilling Co., Tulsa, has a shallow operation under way 2 miles southeast of Center, Pontotoc County, Oklahoma. Location is for 1 Bumbers, located in the NE NE SW 28-4n-5e. It is a mile east of the South Center pool.

Burnett Drilling Co., Magnolia, Ark., has a rig working for Burnett Production Co., its affiliated company, at a wildcat location 2 miles southeast of Lewisville, Lafayette County, Arkansas. The test is 1 Patten estate, in the NW SE NW 25-16s-24w. Location is a mile south of the Lewisville field. Hole is projected to 4,000 ft.

Dunbar Drilling Co. is the contractor on a 3,500-ft. Weber test which Crusader Corp. and Frontier Refining Co. are starting on the North Cross Mountain prospect in Moffat County, northwestern Colorado. Location is in the C SE NE 2-5n-98w.

Carl Brooks, Oil City, La., is contractor on the first of two wildcat tests which Magnolia Petroleum Co. has projected for the Randolph prospect on the Claiborne-Union parish line, eastern Louisiana. The first test is 1 Kelly, SW NE SW 12-23n-4w, a mile southwest of Junction City, in Claiborne Parish. Hole is scheduled to go to 3,200 ft.

Milton Crow, Inc., Shreveport, is starting a 6,800-ft. Smackover lime test for Austin E. Stewart and J. Lee Youngblood at 1 Wise, in the C NE SE 1-15s-25w, northwest of Palm, in northern Lafayette County, southwestern Arkansas. Location is 2½ miles northeast of nearest production in the Midway field.

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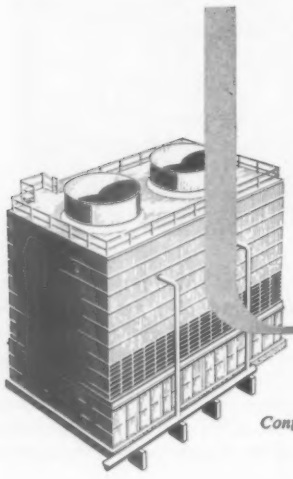

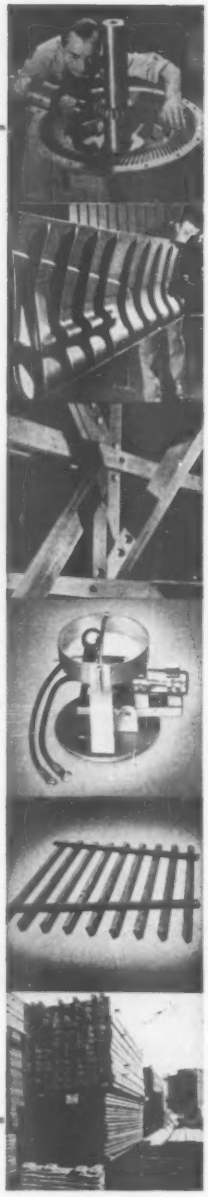

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REFINING

Big Units Planned

El Segundo plant to get $20,000,000 in facilities

SAN FRANCISCO. — Standard Oil Co. of California will build a giant 54,000-bbl. vacuum distillation unit and a 36,000-bbl. fluid catalytic cracking unit at its El Segundo refinery near Los Angeles.

"This will enable us to make better use of the available California crude oil which is in short supply and thus provide more and better products to meet steadily increasing western requirements," said T. S. Petersen, president of California Standard.

"To supplement California supply, we have been importing substantial amounts of crude oil, both from other production centers in the United States and from abroad. Although this imported oil costs more than comparable California production, it is most fortunate that it has been available, because otherwise we could not have balanced supply with our customers' demands."

Early start . . . Engineering work on the El Segundo project will begin immediately. Construction will start a year hence, and completion is set for 1954.

The project will include facilities for recovery of hydrogen sulfide and its conversion to sulfuric acid.

Cumene also will be produced and separated for shipment to Richmond where it will be converted to phenol, a basic petrochemical for the manufacture of resins, plywood adhesives, dyestuffs, insecticides, etc. Construction of the $4,000,000 phenol plant at Richmond will start late this year.

American Liberty to Build New Units at Texas Plant

DALLAS. — American Liberty Oil Co., of Dallas, has let contract to Fluor Corp., of Los Angeles, for engineering and construction of a feed-preparation unit, a TCC unit, a gas-fractionation plant, and for modification of an existing polymerization plant at its Mount Pleasant, Tex., refinery.

Fluor's Mid-Continent division at Houston will do the engineering work on the new facilities.

American Liberty's Mount Pleasant installation currently has a daily crude-oil-charge capacity of 14,000 bbl., and thermal operations total 7,100 bbl. daily. The latter figure includes 2,200 bbl. daily of visbreaking and 900 bbl. daily of reforming capacity. Polymer production capacity is 225 bbl. daily.

The firm also has a 3,300-bbl. refinery at Winnsboro, Tex.

Filtrol Corp. Pushes Plans For Waste Chemicals Plant

VERNON, Calif. — Filtrol Corp. is scheduled to break ground before the end of the year for a $5,000,000 waste-products chemical plant adjacent to the company's facilities here.

The new plant will turn out ammonium sulfate, a fertilizer, and highly pure alumina, a vital material for catalysts in making high-octane gasoline. Construction is the outgrowth of recent studies conducted by the company to find uses for waste chemical products.

The new unit will receive ammonia and sulfuric acid from Shell Chemical Co. for manufacturing fertilizer.

According to Filtrol officials, the plant should be on stream by the fourth quarter of 1953. It recently was granted an accelerated amortization allowance of 55 per cent by the Defense Production Administration.

Texas Eastman to Produce New Synthetic Hard Wax

LONGVIEW, Tex.—A new petrochemical, a synthetic hard wax, will be produced in a $3,800,000 plant to be built by Texas Eastman Co. near here.

The low-molecular-weight polyethylene product is expected to be competitive with hard natural waxes, most of which now are imported.

The company has been granted a certificate of rapid amortization for 50 per cent of the cost of the wax unit. Other certificates include 60 per cent of a $7,000,000 for polyethylene-plastics material, 50 per cent of $6,301,685 for butyraldehyde, and $5,787,000 for synthetic methyl alcohol—all at the Longview plant.

Monsanto Begins Construction Of West Coast Phenol Unit

SAN FRANCISCO.—Monsanto Chemical Co. has started construction of its new phenol plant near Avon, Calif. *(The Oil and Gas Journal, February 25, page 201).*

The new plant will be Monsanto's largest single installation on the West

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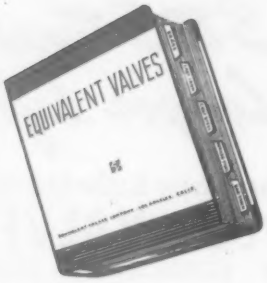

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Coast. It is scheduled to be in operation by early 1954, using a process recently developed by the company.

It is reported that the operation will be at least partially based on raw hydrocarbon stocks provided by Tide Water Associated Oil Co. from its nearby refinery. The latter firm and Monsanto currently are building a sulfuric acid plant also near Avon.

Proven Refinery Approved

WASHINGTON.—The proposed refinery of Proven Oil & Refining Co. at Florence, Ariz., has been approved for accelerated amortization by the Defense Production Administration.

The 16,500-bbl. refinery will cost an estimated $17,339,800.

DPA approved quick tax write-off on 90 per cent of $830,000; 65 per cent of $9,017,300; 45 per cent of $6,748,000; and 15 per cent of $744,500.

For details on the status of the refinery, see The Oil and Gas Journal, August 11, page 76.

Refining Briefs

Shell Oil Co. has awarded contract to Procon, Inc., of Chicago, to build a 16,000-bbl. per day Platforming unit at the company's Wood River, Ill., refinery. Construction is scheduled to begin immediately. The new unit will be similar to one designed for the manufacture of benzene now nearing completion at Shell's Houston refinery.

Globe Oil & Refining Co. has contracted with Graff Engineering Co., of Dallas, to design a unit to recover sulfur from hydrogen sulfide extracted from refinery gases at the company's Lemont, Ill., refinery. The unit will produce 15 short tons of elemental sulfur per day. Present Girbotol facilities at Lemont will be expanded by an additional Girbotol DEA absorber. Erection of the units will be done by refinery crews. Recently Globe was given a certificate of rapid amortization for 70 per cent of the $182,890 sulfur project.

Empire Petroleum Co. revealed plans last week for an ambitious expansion program in both the production and refining fields. E. M. Stone, company president, said capacity of Empire's Denver refinery will be increased from the existing 1,000 bbl. daily to 5,000 bbl. daily. The company has a contract to deliver 850 bbl. daily of its output to Bay Petroleum Corp. It now buys all of its crude but plans to develop its own production in the future, Stone said.

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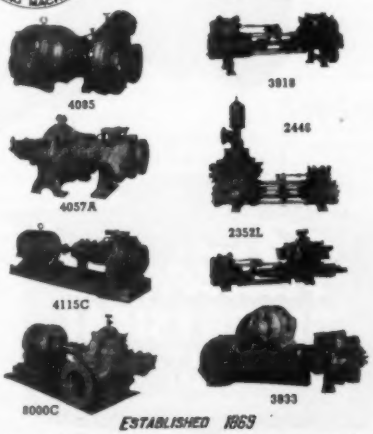

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LEADING THE FIELD OF SEISMIC EXPLORATION

Williston Edges Toward Normality

IT is becoming obvious that the Williston basin is going to be a tougher nut to crack than many anticipated from the initial run of discoveries. Even the most excited now recognize the fact that every lease within the limits of the Williston basin isn't going to yield an oil well.

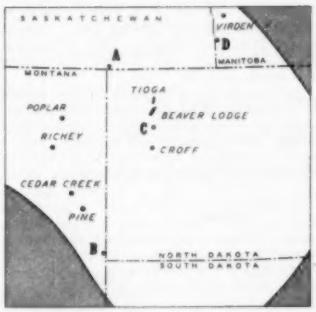
Following close on the heels of Amerada Petroleum Corp.'s initial producer on the Nesson anticline came four discoveries in eastern Montana and two more on the Nesson anticline. Overnight the rank wildcat province became one of the hottest in history. The frantic rush for leases drove prices upward and upward out of all reason —some rank wildcat leases went for prices that wouldn't have been paid in the tried and proven province of West Texas.

Then the list of dry wildcats began to grow. Not one wildcat off the long-known, major structural features in the United States' portion of the basin has found oil in commercial quantities. Recently, wells scheduled as development wells have been completed dry. This declining success ratio has resulted in a sorely needed cold shower for the basin. The much-too-high lease prices have probably seen their peak. The Williston basin is ready to settle down to a normal development.

This doesn't mean that optimism for the basin's potentialities is weakening. The basin is merely approaching a stage that hits every new province after the initial excitement has worn off. Williston is still a new province, but one which is edging away from a very unusual and perhaps unfortunate beginning.

Information on this young province is being compiled rapidly. Geophysical operations, particularly seismic, are now at all-time highs in the basin. Surface work played a significant role in the prelude to the development of the Nesson anticline, but, throughout most of the basin, surface reflections of potential traps at depths have not been found so that operators must turn to geophysics for mapping.

All of the oil found in the basin to



date appears to be accumulated in structural traps, but stratigraphic accumulations offer great potentialities. All of the Paleozoic beds that are present in the basin have wedge edges under nonconformable Mesozoics. With sufficient velocity control these traps can be located by the seismograph. As more holes are dug and more velocity surveys run, the seismic records now being made will begin to acquire their real worth.

Recent progress in the Williston basin has included the official completion of Shell Oil Co. 1 Little Beaver (B on sketch) for a pumping potential of 240 bbl. of oil and 40 bbl. of water from Ordovician rocks. Amerada is testing what appears to be another discovery on the Nesson anticline (C on sketch) between Beaver Lodge and Croff.

Up in Manitoba, California Standard Co. 5-32 Tilston Province (D on sketch), which flowed 33°-gravity oil on drill-stem tests, has been completed as an oil well in the Mississippian at about 3,100 ft. This well and the still-developing Virden field hint of what might be found in the Mississippian wedgeout along the east and south sides of the basin. A potential discovery for the Canadian portion of the Williston basin is Socony-Vacuum Exploration Co. et al 1 Ratcliffe (A on sketch) in Saskatchewan. This wildcat recovered a little oil on a drill-stem test in the Mississippian, but is now drilling ahead to check deeper rocks.

In summary, the dry holes scattered through North and South Dakota and the water in some of eastern Montana's wells have calmed abnormal excitement in the Williston basin. Normal development will now proceed.

Philip C. Ingalls.

HIGHLIGHTS OF WEEK'S DEVELOPMENTS

WYOMING . . . G. H. Vaughan Production Co. has tested oil in Tensleep at 1 Unit, SW NE NW 11-15n-91w, Carbon County, for what promises to be the most important development of the year to date in the state. The test is the first Tensleep trial in the area south of Hatfield, opening a broad area in the Green River basin to Tensleep possibilities.

NORTH DAKOTA . . . Amerada Petroleum Corp. swabbed 36 bbl. of oil and 58 bbl. of water through perforations 8,998-9,042 ft. in 10 hours, and 113 bbl. of oil, 72 bbl. of water in 18 hours at 1 North Dakota "D."

MONTANA . . . Shell Oil Co. announced completion gages on three wells in the Richey area. The company also completed the Little Beaver discovery in Fallon County, the southernmost strike along the Baker-Glendive anticline to date. Five new wildcat locations were announced for the Williston basin area of the state in generally important areas.

WEST TEXAS . . . Phillips Petroleum Co. 1-CC University, northeast Andrews County, which may prove a northwest extension to the structure discovered at Magnolia 1 University, found an additional 50 ft. of Devonian pay in testing from 12,541-91 ft. Oil surfaced in 2 hours and 38 minutes to flow 32 bbl. in 1 hour. Devonian top was high to Magnolia's well.

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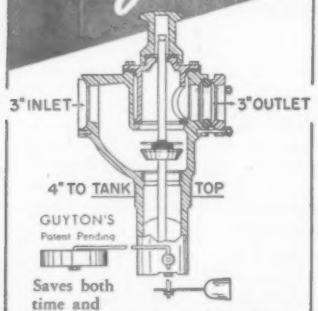

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California

Turk Anticline Wildcat Completed in Fresno

LOS ANGELES.—Richfield Oil Corp. has completed its wildcat at Turk anticline in Fresno County as a large condensate producer and after drilling three unsuccessful tests near Sutter City in Sutter County has made a new gas discovery.

The Turk anticline well was completed, flowing 400 bbl. daily of clean 59°-gravity condensate and 6,300 M.c.f. of gas. Flow was through a 25/64-in. bean, with a tubing pressure of 1,525 psi. Production was from an Eocene sand which is closely related to the Gatchell sand of Coalinga Nose, 15 miles south. Hole was carried to 9,970 ft. but was plugged back to 9,423 ft. and 7-in. casing was set at 9,220 ft.

Located in SW NE 14-17s-15e, the wildcat is 12 miles north of Coalinga production and about the same distance west of Helm field.

The Sutter County gas discovery was 1 Sutter Community-A, located in 8-15n-2e or about 2 miles southeast of Marysville Buttes gas production. On a 2½-hour test at 1,731-1,820 ft. the wildcat flowed gas at the rate of 3,500 M.c.f. daily. After drilling deeper in search of additional gas sands a second formation test was run at 2,075-2,141 ft. On this test it flowed at the daily rate of 5,200 M.c.f. The wildcat was last reported drilling at 3,035 ft.

Of the other northern counties wildcats, that of Stanolind Oil Co. of California at Drakes Bay in Marin County was one of the most closely watched. Last reported drilling at 4,900 ft., field sources state the wildcat had sufficient showings to warrant running five formation tests. None of the results have been disclosed. Labeled 1 Robson, the wildcat is about 10 miles northwest of San Francisco in 33-2n-8w.

After testing shows encountered in its wildcat in the Eureka area of Humbolt County, The Texas Co. abandoned the test and is preparing to start another. The unsuccessful well was 1 Holmes-Eureka in 9-2n-1e, drilled to 6,110 ft. and then plugged back to 3,400 ft. for a test of shows encountered while drilling. The new test is A-1 Little, 2 miles east of Eureka gas field in 24-3n-1w.

A San Joaquin Valley development was the addition of a new Pliocene sand in Lost Hills field. Superior Oil Co. 1 Lost Hills-Government, in 18-26s-21e, on a formation test at 2,895-2,971 ft. recovered 2,276 ft. of 24°-gravity crude. Following the test 8-in. casing was set at 2,890 ft. and a 5½-in. perforated liner at 2,967 ft. The well was in process of being completed at last reports.

Richfield's second Eocene test at Wheeler Ridge has been bottomed at 10,202 ft. after topping the Eocene oil sand at about 10,065 ft. This was approximately 180 ft. lower than the discovery well, 1,000 ft. northeast, found the pay. The well, 76-29 Kern County Land-D, early in July on a formation test at 6,300-6,500 ft. flowed 44°-gravity crude from a new Miocene sand at a daily rate of 1,100 bbl.

CALIFORNIA SUCCESSFUL WILDCATS

Kern County, Cymric area, Phacoides pool discovery: Intex Oil Co. 34 Cymric, SE NW 21-29s-21e, blowed 68 bbl. per day, through perforations at 4,754-4,794 ft., 34.4°-gravity crude, 14/64-in. bean. Phacoides 4,755 ft., Oceanic 5,123 ft., TD 5,215 ft., plugged back to 4,805 ft., elev. 935 ft.

Kern County, Schist discovery 1 mile SE of Mountain View: P. A. Doheny 1 Di Giorgio, SW NE 3-31s-29e, pumped 24 bbl. per day through perforations at 4,842-4,921 ft., 27°-gravity crude, schist 4,916 ft., TD 4,922 ft., elev. 506 ft.

Los Angeles County, Southeast extension to Santa Fe Springs: Pray & Walker 1 Gauldin Comm., 5-3s-11w, flowed at rate of 300 bbl. per day through perforations at 7,375-7,500 ft., 32/64-in. bean, deepened from 7,079 ft., TD 8,200 ft., plugged back to 7,500 ft., elev. 176 ft.

CALIFORNIA WILDCAT FAILURES

Kern County, Antelope Hills area: Ferguson & Bosworth 1 Theta, 2-28s-19e, dry, TD 1,000 ft., elev. unreported.

Devils Den area: M J M & M Oil Co. 1 University, 3-25s-18e, dry, Escudo 961 ft., TD 2,136 ft., elev. 603 ft.

Shale Hills area: Standard Oil Co. 1 Bergman, 5-27s-18e, dry, TD 7,141 ft., elev. 1,392 ft.

Sharktooth area: Pacific Supply Cooperative 2 Bishop, 24-28s-28e, dry, Pyramid Hills 2,111 ft., Vedder 2,208 ft., TD 2,227 ft., elev. 870 ft.

Los Angeles County, Mission anticline area: Standard Oil Co. 4-1 Mission, 1-2n-16w, dry, TD 6,351 ft.

Yolo County, Dunnigan Hills area: Mohawk Petroleum Corp. 1 Cobb, 15-11n-1w, dry, TD 3,000 ft.

Mississippi

New Wilcox Strike Finaled in Adams County

JACKSON.—A new Wilcox discovery has been completed in Adams County, Mississippi, at the John S. Callon 1 R. L. Emery, Jr., Section 35-6n-1w, located approximately 4½ miles east of La Grange field. Casing was run to 6,402 ft. and perforated 6,348-50 ft. On completion test the well flowed 240 bbl. of 35.2°-gravity oil per day on ¼-in. choke with tubing pressure 250 psi.

Also in Adams County, another Wilcox discovery is in the process of being completed at the John S. Callon 1 James W. Vaught, Section 1-5n-1w, located approximately 3 miles northeast of the Pellucid Bayou field. Casing was run to 6,651 ft. and perforated 6,594-95 ft. and squeezed with 90 sacks of cement. Casing was then perforated 6,588-90 ft. and tubing was run to 6,552 ft. On first test the well flowed 115 bbl. of oil in 9 hours on ¼ in. choke with tubing pressure 100 psi. On a 24-hour test using various chokes (⅛, ¼, 4/64) the well flowed 235 bbl. of oil with tubing pressure 250 psi. and casing pressure 420 psi. Flow was cut 6/10 per cent with BS&W. At last report operators were continuing testing. Field names for these discoveries have not been selected.

In the Paleozoic area of northeastern Mississippi, Union Producing Co., 1 Neal, Section 21-15s-6e, Monroe County, has been abandoned as a dry hole at total depth of 6,553 ft. This test was located approximately 2,400 ft. northwest of Union 1 Sanders, gas well which was the discovery well for Muldon field. While the 1 Neal was being drilled, no detailed information was released. Continuous diamond cores were cut from 1,866 to 6,553 ft. which included all the Pennsylvanian, Mississippian, and Devonian section penetrated. These cores along with all other information will be released soon.

MISSISSIPPI SUCCESSFUL WILDCAT

Adams County: John S. Callon, 1 R. L. Emery, Jr., Sec. 35-6n-1w, IP flowed

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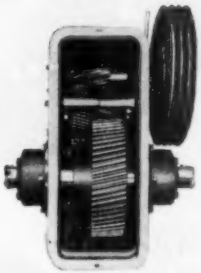

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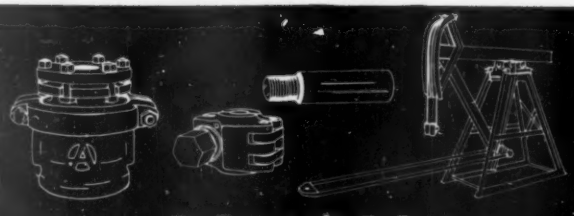

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MISSISSIPPI WILDCAT FAILURES

Adams County: B. Serio-Gulmon and John, 1 Clara L. Mazique, Sec. 10-5n-3w, dry, TD 6,755 ft.

Jefferson County: G. A. Clements, 1 E. G. Truly, Sec. 57-8n-1e, dry, TD 6,509 ft.

Leflore County: Sneed Brothers, 1 Fritz Morgan, Sec. 33-18n-2w, dry, TD 6,519 ft.

Southwest Texas

Casing Set at Deep Duval County Test

CORPUS CHRISTI.—Blanco Oil Co. and Al Buchanan have logged and set casing in their Duval County deep test at Seven Sisters field, about 3 miles northwest of Freer. Electric log was run, and 5½ in. casing was set at 8,255 ft. Perforations will be made around 8,150 ft. Electric log and side wall cores showed sand in the Queen City sand section at 5,878-5,910 ft. Producing possibilities showed very good in the side wall cores, but this section will not be tested at this time. Several sands between 8,124-8,770 ft. tested gas and distillate in the Wilcox.

Drillsite is on a 40-acre lease, J. Poitevent lease, Section 385, Abstract 409. Apparently completion will be attempted in section between 8,100-8,200 ft.

On open tool test, Abercrombie 1 Fox, in Willacy County, Willimar area, 15 miles east of Raymondville, recovered 2,390 ft. of 30°-gravity oil with tool open for 20 minutes. Electric log was run and casing was set at total depth of 7,905 ft. Operators are waiting on cement, and preparing to perforate completion. Location is on a 57.03 lease, San Juan de Carricitos Grant, Share 7. Well is slightly southeast of Willimar field.

L. M. Lockhart 1 Shary estate gas and distillate discovery, approximately 8 miles west of Edinburg was completed with an open flow of 18,000,000 cu. ft. of gas per day from perforations made at 8,172-8,198 ft. Well flowed 4,700,000 cu. ft. of gas per day on a ¼-in. choke plus 48 bbl. per day of clear distillate with 3,238 psi. of tubing pressure; in addition, the well flowed 2,900,000 cu. ft. of gas per day on 3/16-in. choke, and 1,300,000 cu. ft. of gas per day on ⅛ in. choke. Pipe line connection is Tennessee Gas Transmission Co.

Location is on a 847 acre lease, in Rio Grande Development Co. Subdivision of Melado Portion of San Salvador del Tule Grant. Operators have location made for 1 Bryan Hanks due east of this discovery.

SOUTHWEST TEXAS (DISTRICTS 1 AND 4) SUCCESSFUL WILDCAT

Aransas County: Hunt Oil Co. 1-38 St.-Copano Bay, St. Tr. 38 Copano Bay, 1½ miles NE Fulton Beach field, 1½ miles SE Copano Bay field and 1½ miles SW Lamar field, TD 10,005 ft., IP 2,500,000 M.c.f. gas and 50 bbl. distillate, 3/16-in. choke, GOR 50,000:1, Perforations 7,115-20 in Frio zone.

SOUTHWEST TEXAS (DISTRICTS 1 AND 4) WILDCAT FAILURES

Bexar County: Hyman Bros. 1 Hyman fee, Lot 1 Block 50, San Antonio Surburban Irrigated Farms Subd., Tract in C. Logan

AXELSON PLUNGERS

outstanding in design and quality

Axelson patented pin end, grooved plunger, chrome plated. Most frequently used under abrasive conditions where a loose fit is desirable.

Axelson deep well plunger pump, "RLA," rod liner type, with stationary barrel.

The many pumping conditions encountered in the production of oil can be met successfully by use of proper combinations of operating surfaces and design features available in Axelson plungers.

Send for Bulletin No. 5005 which details data relative to Axelson plungers and serves as a guide in the proper selection of appropriate plungers.

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& L. P. Houghton surveys, dry, TD 8,892 ft.

Duval County: F. Wm. Carr, W. E. Fox & C. F. Falley 1 Amado Garcia et al "San Diego de Arriba" Julian & Ventura Flores Grant A-212, 9 miles N of San Diego, minor shows 4,725-90 Pettus zone, dry, TD 5,030 ft.

Sam Cunningham 1 Amallie B. Scott Realitos S/D of Copita Farm and Gardens Tract, Sec. 18, Blk. 2, dry, TD 5,827 ft.

Sid Katz et al 2 Clara Driscoll Estate T. & N. O. Sur. Sec. 8, A-1107, 14 miles W of San Diego, dry, TD 3,665 ft.

Kenedy County: Humble Oil & Refining Co. 1-C Mrs. S. K. East Las Motas de la Barreta Grant, dry, 8D 13,388 ft.

Wilson County: H. H. Howell, 1-A G. N. Evans, Wm. Kirk Sur. 77, 7 miles S SE Pandora, dry, TD 4,618 ft.

Appalachian-Ohio

Gas Discoveries Completed in Maryland

PITTSBURGH.—Garrett County, Maryland, Colombian Carbon Co., completed 2 N. K. Welch, gagin 381,000 cu. ft. gas, TD 3,052 ft., Cumberland & Allegheny Gas Co. 1 Walter Beckman, tested 500,000 cu. ft. gas Oriskany sand, TD 3,351 ft.

Pennsylvania.—Unity Township, Westmoreland County, Southwest Pennsylvania: Peoples Natural Gas Co. 4003 A. J. Dotterway, is drilling 8,110 ft., No. 4008 J. R. Frola is drilling at 4,459 ft.

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MARYLAND SUCCESSFUL WILDCATS

Garrett County: Columbian Carbon Co. 2 N. K. Welch, 381,000 cu. ft. gas, TD 3,052 ft.

Cumberland & Allegheny Gas Co. 1 Walter Beckman, 500,000 cu. ft. gas, Oriskany sand, TD 3,351 ft.

OHIO

Union Sulphur and Oil Corp. of New York have acquired a 133,000-acre block of leases on the Cambridge anticline in Washington and Noble counties, and plan on extensive tests of the deeper horizons. The Keta Oil & Gas Co. of Bradford, Pennsylvania, have leased 65,000 acres in Belmont County, and plan to explore the Oriskany and Clinton sands in the near future.

OHIO WILDCAT FAILURE

Washington County, Watertown Township: James Shearer et al 1 Robert Farley, Sec. 27, Oriskany 4,308-4,314 ft., TD 4,316 ft.

North-Central Texas

Conglomerate Strike Finaled in Knox

WICHITA FALLS.—Deep Rock Oil Corp. 1 J. C. Hawkins, 43-2-D&W, Knox County wildcat 4½ miles southeast of North Knox City field, completed as a conglomerate discovery, with a daily pumping potential of 150 bbl. of oil. The well had been drilled to 6,095 ft., in the Ellenburger, which carried salt water.

Cooke County had a Pennsylvanian discovery prospect at W. P. Luse 1 W. B. Hinton, 1 mile north of Gainesville. Operators were running casing for production tests after a drill-stem test in the lower Pennsylvanian sand from 3,387-93 ft. returned 450 ft. of clean oil in 1 hour.

Fitzhugh & Powell made location for 4 D. B. Allred, Cooke County wildcat to be drilled in the G. de los Santos Survey, A-894, 1 mile north of Woodbine. Projected depth was 3,500 ft.

In Shackelford County, Pitzer & Sons 1 F. G. Coates, 30-13-T&P, wildcat 20 miles southwest of Albany, completed on the pump for 45 bbl. of oil a day from the Bluff Creek sand pay at 1,640-49 ft.

Humble Oil & Refining Co. 1 Mrs. Pauline Murrie, near the Lueders Baptist Encampment, was said to be flowing oil at the rate of 7 bbl. an hour from Cooke sand at 1,764-84 ft. Location is 1 mile northeast of Lueders.

Northeast of Abilene, Humble 1 Herman West, 57-14-T&P, recovered 70 ft. of oil and 70 ft. of heavily oil-cut mud on a 30-minute drill-stem test in Strawn sand at 3,881-93 ft. Further oil mud was returned on test between packer at 3,891 and total depth of 3,903 ft. Oil reached the surface in 26 minutes but was not allowed to flow.

NORTH CENTRAL TEXAS (DISTRICTS 9 AND 7-B) SUCCESSFUL WILDCATS

Archer County: Harry F. Snebold 1 J. F. O'Donohoe, Sec. 92, ATNCL, TD 1,610 ft., pay 1,590 ft., IP pumped 17 bbl. 40°-gravity oil.

Harry F. Snebold 3 O'Donohoe, Sec. 92, ATNCL, TD 1,591 ft., pay 1,588 ft., IP pumped 84 bbl. 41°-gravity oil.

Coleman County: L. H. Choate et al 1 J. Ballard, Blk. 26, J. F. Gordon Sur., TD 3,094 ft., elev. 1,798 ft., pay 2,443 ft., IP 56 bbl. 40°-gravity oil, 14/64-in. choke, TP 550 psi., GOR 1,200 cu. ft.

L. J. Maxwell and M. W. Freeman 2

Fayette Cooley, Sec. 242, J. Riner Sur., TD 970 ft., pay 965 ft, IP 35.7 bbl. 41°-gravity oil, 7/164-in. choke, TP 35 psi., GOR 1,200 cu. ft.

Haskell County: Pan American Production Co. 1 Kiekê-Scott Unit 3, MEP&P, TD 2,943 ft., elev. 1,524 ft., pay 2,491 ft., IP pumped 15.7 bbl. oil.

Jack County: Wrightsman Oil Co. 1 Sara E. Perrin, Tract 2, Sec. 2,712, TE&L, TD 5,281 ft., perf. Bend conglomerate 5,170-5,281 ft., IP 408 bbl. 42°-gravity oil, ½-in. choke, TP 100 psi., GOR 400 cu. ft.

Jones County: Lamar Hunt Trust 1 J. M. Byrd, Blk. 126, DeWitt CSL, TD 3,003 ft., elev. 1,782 ft., pay 2,271 ft., IP pumped 55 bbl. 40°-gravity oil.

Nolan County: J. C. Barnes 1-A Irl Favor, 47-21-T&P, TD 6,155 ft., elev. 2,106 ft., Ellenburger 5,895 ft., pay 6,075 ft., IP 104 bbl. 49°-gravity oil, ¼-in. choke, TP 50 psi., GOR 337 cu. ft.

Taylor County: Geochemical Surveys 1 C. T. Tipton, 148-26-GCSL, TD 2,629 ft., elev. 1,849 ft., pay 2,228 ft., IP pumped 63.6 bbl. 41°-gravity oil.

NORTH CENTRAL TEXAS (DISTRICTS 9 AND 7-B) WILDCAT FAILURES

Archer County: Harry F. Snebold 2 O'Donohoe, Blk. 92, ATNCL, dry, TD 1,628 ft.
C. P. Thurkill 1 Gordon Elmore, Hooper & Wade Sur. 1, A-727, dry, TD 1,346 ft.

Brown County: Paul Billingsley 1 T. R. A. Price, Henry Hill Sur., dry, TD 1,805 ft.

Callahan County: W. D. Waltman and Peet Hall Drilling Co. 1 E. B. Goodman, Anthony Bates Sur., A-12, dry, TD 1,920 ft.
Warren & Bradshaw 1 Ludie H. Owen, Sec. 236, Geo. Massingale Sur., dry, TD 4,156 ft.

Clay County: H. R. Wilson 1 Stine, Blk. 65, Bacon Subd., dry, TD 1,884 ft.

Coleman County: Marshall Pipe & Supply Co. 1 Westbrook Oil Co., D. A. Jackson Sur. 153, dry, TD 573 ft.

Cooke County: Sam Lett 1 Frances Yarborough, Allen Elston Sur., A-351, dry, TD 4,727 ft., in the Ellenburger.

Grayson County: Magnolia Petroleum Co. 1 F. H. Bailey, J. Coryell Sur., A-261, dry, TD 8,987 ft.

Jack County: John L. McMahon Jr. 9-A Roney, Sec. 3,327, TE&L, dry, TD 420 ft.
Perkins & Cullum 1 J. T. Roney, Blk. 3,324, TE&L, dry, TD 4,707 ft.
Star Oil Co. 1 Bloodworth Est., J. B. Irvine Sur., A-312, dry, TD 5,000 ft., elev. 1,056 ft. Caddo 4,899 ft.

Jones County: Lewis Drilling Co. 1 A. W. Clemmer, 15-17-T&P, dry, TD 4,606 ft.

Montague County: Reno Oil Co. 1 Lee Crenshaw, W. Wallace Sur., A-834, dry, TD 5,763 ft.

Shackelford County: Andrew M. Howsley 2 T. G. Hendrick, Sec. 28, J. Wilson Sur., dry, TD 1,478 ft.
J. Walter Long Jr. 1 Dawson & Conway, Sec. 176, ETRC Sur., dry, TD 1,740 ft.

Stonewall County: Sun Oil Co. 1 R. L. McArthur, 321-2-H&TC, dry, TD 6,410 ft.

Taylor County: Edgar Davis Drilling Co. 1 O. E. Radford, Sec. 40, LAL Sur., dry, TD 4,843 ft.
Morty Freeman 1 W. E. Jones, Sec. 43, William Bishop Sur., dry, TD 4,608 ft., elev., 1,775 ft., Caddo 4,553 ft.
Carl Hovgard 1 W. A. Daniels, 60-19-T&P, dry, TD 3,050 ft., elev. 1,984 ft., Flippen 2,822 ft., Hope 3,046 ft.
West Central Drilling Co. 1 K. P. Hamilton, Sec. 123, J. William Page Sur., dry, TD 3,145 ft.

Canadian Fields

Second Pigeon Lake Well Finds Oil

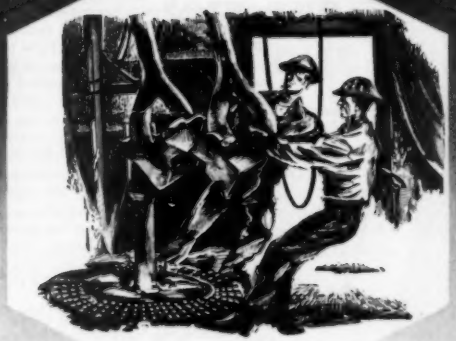
CALGARY.—Texaco Exploration Co.'s prolific D3 wet gas and D2 oil discovery well at Pigeon Lake is the second well in that area to encounter a D3 oil column. This venture, located about 6¼ miles northeast of the original discovery well at Pigeon Lake and 3 miles southwest of Bonnie Glen D3 oil wells, sprayed light oil to the surface during latest drill-stem test.

The well, Texaco A-1 Pigeon Lake, on LSD 14, 36-46-28w4, is 35 miles southwest of Edmonton. D3 Devonian contact is 6,670 ft., or 3,704 ft. subsea, and some 254 ft. of naphtha-bearing gas zone was found prior to entering the oil zone. First drill-stem test to show oil at the well was run from 6,925-35 ft. for 28 minutes. Natural gas flowed to the surface in 2 minutes at rate of 2,025,000 cu. ft. daily in 8 minutes, and a spray of oil was evident in 11 minutes. Pipe recovery was 185 ft. of 41.5° gravity. Crew is now coring and testing in the D3 oil column.

Imperial Oil, Ltd., Canadian Gulf Oil Co. and Hudson's Bay Oil & Gas Co., Ltd., have indicated oil discovery or extension at their joint exploratory venture southeast of Joseph Lake Viking oil field in central Alberta. The new oil well, in the Mandy Lake area about 22 miles southeast of Edmonton, is a joint Imperial-Gulf-Hudson Bay operation that lies on a unitized block in the region.

The well, Imperial-Gulf-Hudson Bay 11-31-49-21 Mandy Lake, on LSD 11, 31-39-21w4,

CANADA'S OIL BANK



Branches throughout Canada's oil-rich western plains. On-the-spot information available through E. B. Durham, Supervisor, Calgary, Alberta, or Head Office, Montreal

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ssets exceed $2,500,000,000

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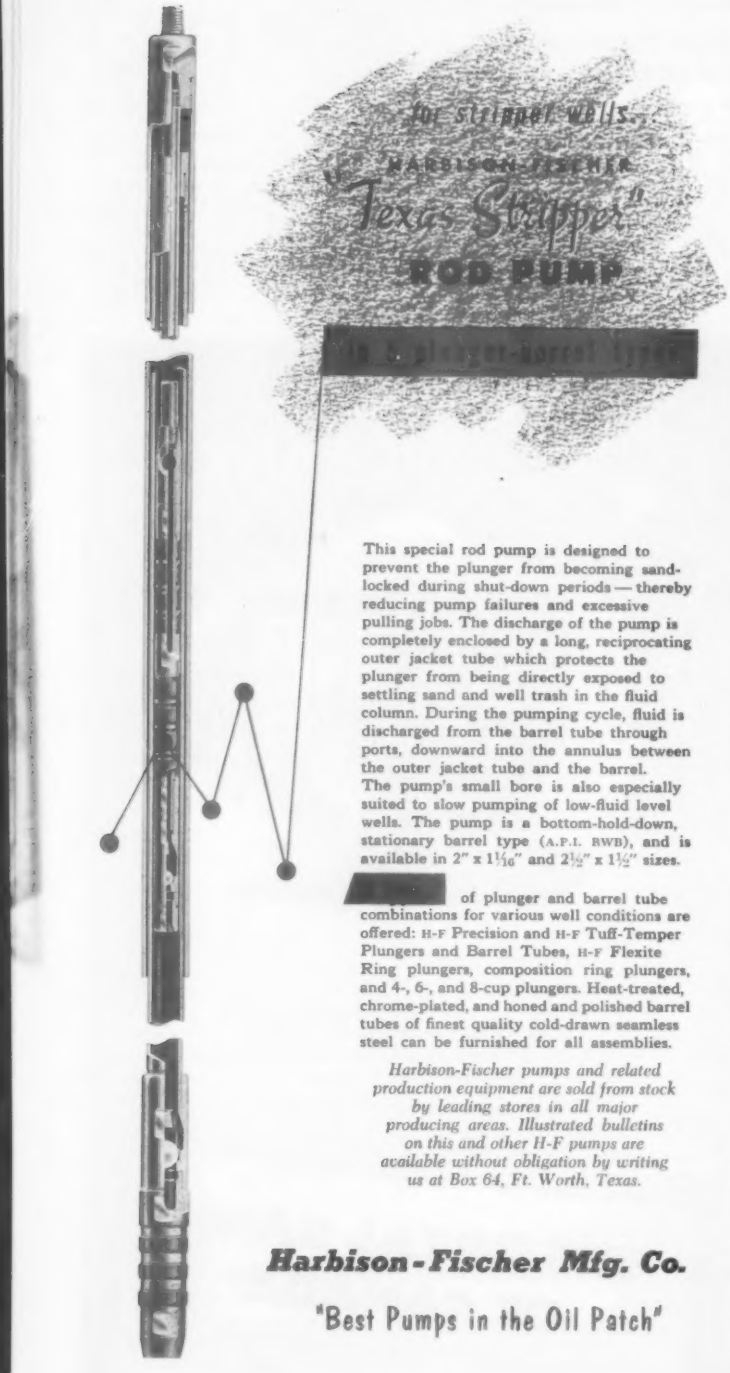


This special rod pump is designed to prevent the plunger from becoming sand-locked during shut-down periods — thereby reducing pump failures and excessive pulling jobs. The discharge of the pump is completely enclosed by a long, reciprocating outer jacket tube which protects the plunger from being directly exposed to settling sand and well trash in the fluid column. During the pumping cycle, fluid is discharged from the barrel tube through ports, downward into the annulus between the outer jacket tube and the barrel. The pump's small bore is also especially suited to slow pumping of low-fluid level wells. The pump is a bottom-hold-down, stationary barrel type (A.P.I. RWB), and is available in 2" x 1 1/16" and 2 1/2" x 1 1/2" sizes.

[redacted] of plunger and barrel tube combinations for various well conditions are offered: H-F Precision and H-F Tuff-Temper Plungers and Barrel Tubes, H-F Flexite Ring plungers, composition ring plungers, and 4-, 6-, and 8-cup plungers. Heat-treated, chrome-plated, and honed and polished barrel tubes of finest quality cold-drawn seamless steel can be furnished for all assemblies.

Harbison-Fischer pumps and related production equipment are sold from stock by leading stores in all major producing areas. Illustrated bulletins on this and other H-F pumps are available without obligation by writing us at Box 64, Ft. Worth, Texas.

Harbison-Fischer Mfg. Co.

"Best Pumps in the Oil Patch"

is 2 miles southeast of Joseph Lake oil wells and 1¼ miles east-southeast of Superior 96 Joseph Lake abandonment. Prior to reaching the Viking oil column, the Mandy Lake well found a sizable flow of natural gas in upper section of the Viking.

Top of the gas productive sand is believed to be around 3,260 ft. or 714 ft. subsea; while the oil sand was encountered at approximately 3,268 ft. or 722 ft. subsea. The well flowed 39°-gravity oil during drill-stem test and found around 15 ft. of water-free oil zone. Hole completed drilling at 3,370 ft., and 7-in. string of production casing was set at 3,330 ft.

CANADIAN SUCCESSFUL WILDCATS

Prado 8-28 Chauvin, LSD 8, 28-43-1w4, TD 2,185 ft., IP 120 bbl. daily.

Canadian Delhi et al 1 Minnehik, LSD 12, 22-46-6w5, TD 6,850 ft., capped gas-condensate well.

Shell 1 C. & E., LSD 9, 23-16-26w4, TD 9,601 ft., on production, oil well.

CANADIAN WILDCAT FAILURES

Widney 1 Ward, LSD 7, 30-33-2w4, TD 4,050 ft.

Great Plains-Seaboard 12-11 Peacock, LSD 12, 11-12-24w4, TD 6,000 ft.

Trans Canada Westall 1 Conrad, LSD 9, 18-6-15w4, TD 3,295 ft.

Bailey-Selburn-Husky 1 Hercules, LSD 7, 35-51-23w4, TD 3,201 ft.

Texas Gulf Coast

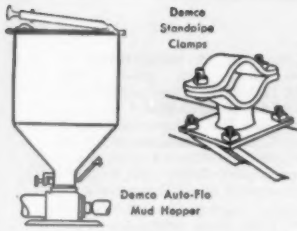
Good Flow Reported At De Witt Extension

HOUSTON.—Kirkwood & Company-W. F. Seeger, Weaver and Sharp's 3 W. H. Kuester, et al, in De Witt County has produced very good flow from perforations at 8,170-8,210 ft. It is an extension test to Gohlke field, about 6½ miles northeast from Thomaston. Flow to tanks was at the rate of 150 bbl. of oil per day, on a ¼-in. choke, and on 1½-hour test flow rate was 176 bbl. of oil per day with a ¾-in. choke. Tubing pressure varied from 180 to 200 psi. Well is still being tested with no potential gage made as yet.

The new producer is on a 901.34-acre lease, P. F. Breeden Survey, Abstract 618, about 1½ miles southwest of previous production, and 1,700 ft. south of 2 which was a dry hole. It also lies about 3 miles east-northeast of Kirkwood and Morgan 1 Bell, a Wilcox oil discovery.

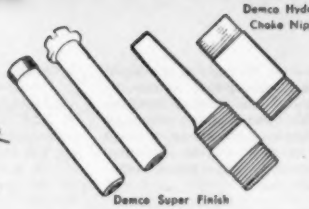
American Republics Corp. and Houston Oil Co. have reported potential on the 1-A H. J. L. Stark, gas well completed in the Nodosaria to extend production in Doty field 2,300 ft. westerly, Orange County. Absolute open flow potential through 24 perforations at 7,960-64 ft. shows the well to be good for 26,000,000 cu. ft. of gas per day with shut-in pressure of 2,716 psi. Hole is bottomed at 8,277 ft. with 5½-in. casing cemented to 8,050 ft. and 2⅜-in. tubing swung at 7,941 ft. Pipe line connection was made by Texas Eastern Transmission Co. On ¼-in. choke well flowed 4,085,000 cu. ft. of gas with tubing pressure of 2,592 psi., 3,605,000 cu. ft. on 15/64-in. choke with pressure of 2,613 psi., 2,605,000 cu. ft. on 13/64-in. choke under 2,644 psi., and 1,590,000 cu. ft. on 10/64-in. choke pressure of 2,682 lb.

Extension is on 236-acre lease, I & G N RR Survey, A-223, Section 14, 2 miles north of Doty, being 2,300 ft. west of Union Pro-



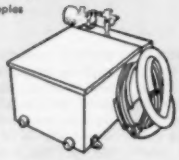
Demco Standpipe Clamps

Demco Auto-Flo Mud Hopper



Demco Hydraulic Choke Nipples

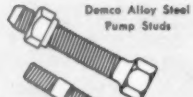
Demco Super Finish Wash Pipes



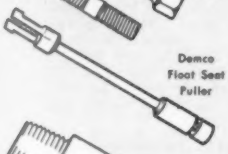
Demco Rod Oiler

Demco Hydraulic Hose Adapters

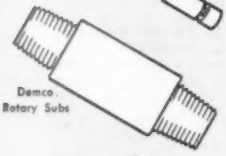
Demco Hose Hobbles



Demco Alloy Steel Pump Studs

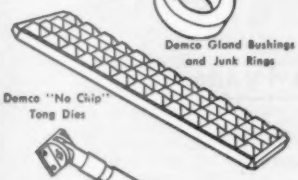


Demco Float Seat Puller

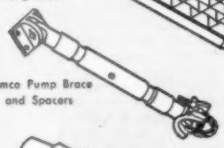


Demco Rotary Subs

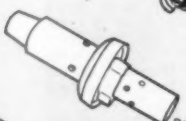
Demco Gland Bushings and Junk Rings



Demco "No Chip" Tong Dies



Demco Pump Brace and Spacers



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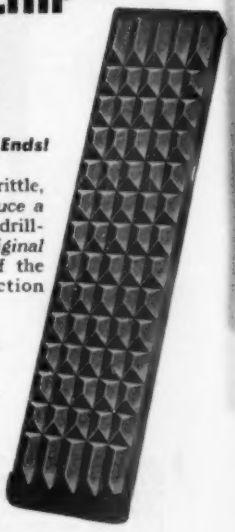

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ducing 2 Brown, gas well, and 2,400 ft. northwest of 1 Brown, dry hole.

On the south flank of Cold Springs field, San Jacinto County, Commercial Petroleum and Transport Co., is cementing liner for completion attempt in A-2 Foster Lumber Co. "A." Hole was made to 13,113 ft. and electrical log run to that depth. Hole has 7-in. casing set at 12,111 ft. with 800 sacks. Two drill-stem tests have been run in open hole with show of gas-distillate in both zones tested. Fifteen-minute test in open hole 10,951-999 ft., ¼-in. chokes, 2,070 ft. of water cushion, made a good blow and showed recovery of water cushion cut with gas, 270 ft. of distillate-cut mud, and 70 ft. of brackish water. Bottom-hole flowing pressure registered 1,400 psi., and shut-in pressure 4,540 psi. First test was made on interval 7,479-94 ft. which flowed 1,000-ft. water cushion to surface in 15 minutes, developed working pressure at the surface of 400 lb., and gave recovery of one stand of distillate, seven stands fresh water and two stands of rat-hole mud. Bottom-hole shut-in pressure was 3,200 lb. Test is on 1542.66-acre lease, George Taylor Survey, A-292, 1,600 ft. southeast of field production.

TEXAS GULF COAST (DISTRICTS 2 AND 3) SUCCESSFUL WILDCATS

Hardin County: Chance Drilling Co., Inc., 1 Nona Mills I. D. Hamilton Sur. A-249, Pine Ridge discovery, 10 miles NE of Sour Lake, IP 85.45 BOPD on 8/64-in. choke, GOR 1,495:1, 37.8° gravity, TD 9,653, PB 9,539, pay zone Yegua, perf. 9,533-39 ft.

Harris County: Petrex Oil Corp. 1 Oldham unit 1 Jos. Bays Sur., A-127, South Fairbanks new pay, IP 110.24 BOPD on 10/64-in. choke, 35.4° gravity GOR 1,094:1, TD 7,270, T/pay 7,218, perf. 12/7,218-7,221 ft., Lock sand.

The Texas Co. 1 H. D. Taylor H. T. & B. RR Sur. 7, Finrock discovery 3½ miles SE Katy, IP 76 BOPD on 8/64-in. choke, 41° gravity, GOR 1,890:1, TD 8,000 ft., PB 7,152 perf. 6,874-77 Yegua sand.

Liberty County: Magnolia Petroleum Co. 1 Gertrude Finley Frank Hardin Sur. A-214, E. Hardin, new pay, perf. 7,624-28 ft., IPF 51.3 BOPD on ⅜-in. choke, 37.4° gravity GOR 377:1 no water, TD 8,521, PB 8,492, pay zone Cockfield, dual gas-oil well perf. 8,229-9,233 ft., IP 28,500,000 M.c.f. gas on open flow, 51° gravity, GOR 46,200:1.

Newton County: Houston Oil Co. and American Republics Corp., 1 Preston Edward Lindsey et al, C. Champion Sur. A-77, NW Hartburg field discovery IPF 33,000,000 M.c.f. gas on open flow, TD 8,075, PB 7,560 ft., perf. 7,443-7,445 for comp., T/pay 7,443, prod. zone Nodosaria.

TEXAS GULF COAST (DISTRICTS 2 AND 3) WILDCAT FAILURES

Calhoun County: Southern Minerals Corp., A-1 W. L. Traylor "A," Phillip Dimmitt, 8 miles NE of Port Lavaca, dry, TD 8,892 ft.

Fayette County: E. & H. Phillips 1 T. Cockrell, S. M. Williams Sur. 3, A-110, 8 miles NW of Flatonia, dry, TD 4,030 ft.

Harris County: N. B. Hunt, 1 G. W. Burkitt Est., H. T. & B. Sur. 3, A-401, dry, TD 8,297 ft.

Karnes County: Jay Simmons et al, 1 Minnie L. Ray, Britton Odom Sur., 8 miles W of Kenedy, dry, TD 7,008 ft.

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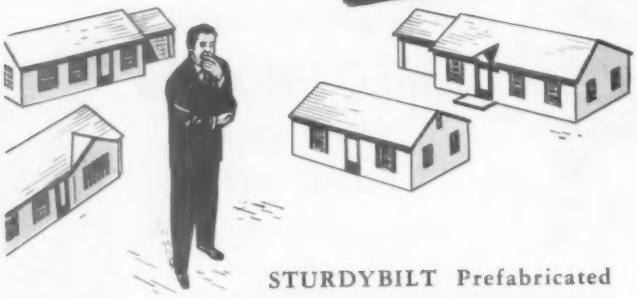

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Eastern Texas

Drilling Begun At Tarrant Tests

DALLAS.—Tarrant County's two exploratory tests had drilling under way last week. Rowan Oil Co. 1 Markum, located 4 miles northwest of Benbrook in the R. Bissett Survey, A-192, was drilling ahead at 1,420 ft. on an 8,200-ft. contract. The other operation is I. Dee Campbell 1 Simon Cannon, 2½ miles northeast of Mansfield in the William Bratton Survey, which was drilling below 2,035 ft.

Sparta Oil Co. of Houston has extended the East Gossett field of Kaufman County at its 1 T&NO RR Survey, with a flowing potential of 104.5 bbl. of 38°-gravity oil a day through 10/64-in. choke. Pay was the Woodbine sand from 3,241-45 ft.

Tex-Jersey Oil Co. 1 H. Brin, A. J. Payne Survey, had prospects of extending Paluxy pay 1 mile southwest of Walter Fair field. Field sources reported sand with oil shows in cores around 4,950 ft.

Byrd Oil Corp. 1 Lucille Wilcoxson, Winnsboro field extension and new pay opener in the Gloyd sand, was making from 60-65 bbl. of oil a day from perforations at 8,265-83 ft. Some wash water with the oil was said to be decreasing.

Trans-American Petroleum Corp. has filed application to drill 1 T. L. Hurst as a 7,500-ft. wildcat in the Z. G. Walker Survey, Shelby County.

EAST TEXAS (DISTRICTS 5 AND 6) WILDCAT FAILURES

Houston County: E. L. Howard, Ralph Spence and American Liberty Oil Co. 1 Clegg.

John Sherdan Sur., A-80, dry, TD 5,940 ft.

Marine Gathering Co. 1 J. C. Merriwether, John Box Sur., A-14, dry, TD 7,570 ft.

Hunt County: Peveto and Hager 1 Ketteman, R. Ragsdale Sur., A-869, dry, TD 4,519 ft.

Wood County: A. R. McElreath 1 W. D. Hass, J. M. Moore Sur., A-383, dry, TD 4,684 ft.

Central Area

ILLINOIS

About 1,000 ft. from the Illinois-Kentucky state line, which has been legally defined as the low water mark of the north bank of the Ohio River, Arthur E. Vandenbark and J. W. McGuire are swabbing 120 bbl. of oil daily after a 40-quart shot in the Aux Vases sand from 2,660-70 ft. at 1 Tom Logsdon, NE NW NW 23-9s-10e, Gallatin County, Illinois. Total depth is 2,670 ft. This well is in a faulted area, and indications are that it may be on a structure that might cross the Ohio River into Union County, Kentucky. To date no pool has been found in this area.

In Jefferson County, 7 miles west of Mt. Vernon, Magnolia Petroleum Co. has found a new and deeper pay at 7 Eubank-Winesburgh unit, SW NW NW 1-3s-1e. The new pay is the Dutch Creek sand (Middle Ordovician) from 3,663-70 ft. On a 2-hour drill-stem test gas surfaced in 8 minutes and recovery was 3,650 ft. of clean oil with bottom-hole pressure of 1,550 psi. The well is located near the south end of Woodlawn pool.

INDIANA

George & Wrather and Aubrey & Tennant 1 Victor A. Anslinger, NW SE NW 13-3s-10w, Gibson County, recover 1,600 ft. of gas, 240 ft. of oil on a 1-hour drill-stem test from 2,017-31 ft. Total depth is 2,150 ft. Francis Beard 1 J. W. Kolb, 330 ft. from south line, 2,960 ft. from east line from Section 21-1s-10w, Gibson County, swabbed 17 bbl. of oil per hour natural from the Aux Vases lime 1,818-25 ft. Total depth is 1,825 ft.

WESTERN KENTUCKY

In Henderson County George Hoffman and Allied Investments and Basin Drilling Co. recovered 370 ft. of drilling fluid, 120 ft. of fresh water on a 1-hour double packer drill-stem test of the Aux Vases from 2,575-90 ft. at 1 Lucy Polley heirs in the SW SW NW 15-O-22.

EASTERN KENTUCKY

In Big Sandy gas field and located on Long Fork in the Pike County sector, Kentucky West Virginia Gas Co. have completed 6,069 Silas Johnson for an initial open flow potential of 1,107,000 cu. ft. of gas daily from the Pennsylvanian salt sand at a total depth of 1,477 ft. Well had a natural flow and a rock pressure of 430 psi. in 12 hours.

Also in Big Sandy field and located on Big Branch of Troublesome Creek in the Knott County sector, Kentucky West Virginia Gas Co. completed a well at 6,148 Silas Boggs. From the Devonian black shales an open flow of 280,000 cu. ft. of gas daily was established at a total depth of 3,421 ft.

MICHIGAN

The Lands Division, Michigan Department of Conservation, leased 62,996 acres of state-owned wildcat lands, and one 40-acre proven tract at a public auction in Lansing August 7-8. A total of 100,137 acres of wildcat leases was placed on the auction block in 24 counties. Bonus paid for the wildcat leases totaled $57,969.00, an average of $1.08 per acre. The proven lease, in Rose City Richfield oil pool, Ogemaw County, was bought by Fran J. Asam for $4,125.

This sale appeared to be the second largest state land sale of record. The largest, according to unofficial reports, was in October, 1950, when leases were auctioned on 153,802 acres of state-owned land for a bonus of $277,886.00, an average of $1.80 per acre. Much of the interest at this sale, where 38 successful bidders participated, was believed to have been stimulated by the recent discovery of Salina-Niagaran gas pays and showings of gas along the rims of the Michigan basin.

ILLINOIS WILDCAT FAILURES

Bond County: A. Wilson 1 Andrews, W½ NE NW 13-5n-3w, dry, TD 1,352 ft.

Christian County: C. Wilson 1 Morris, SW SW NE 11-12n-2w, dry, TD 2,413 ft.

Edgar County: Ernest Zink 2 Pinnell, SW SW NE 12-12n-14w, dry, TD 455 ft.

Edwards County: Arrington 1 H. Harris Comm., SW NW SW 22-1n-10e, dry, TD 3,317 ft.

Hamilton County: Carter Oil Co. 1 Biggerstaff, NE NE SE 11-5s-7e, dry, TD 3,564 ft.

Davis & Hose 1 Mills et al, SE SE SW 15-5s-5e, dry, TD 2,721 ft.

Herndon Drilling Co. 1 Brummet, NW SW NE 8-5s-5e, dry, TD 3,452 ft.

Hancock County: E. White 1 Shaler, SW NW SE 25-4n-5w, dry, TD 517 ft.

Lawrence County: Calvert Drilling Co. 1 Dager, NE SW NE 20-2n-12w, dry, TD 2,429 ft.

Skiles Oil Co. 1 Harbaugr, NW NE SW 10-4n-13w, dry, TD 2,254 ft.

Madison County: H. E. Livermore 1 Buesser, SW SE SE 36-6n-8w, dry, TD 510 ft.

Montgomery County: O. A. Reed 1 Husman, SE SE SE 13-8n-5w, dry, TD 652 ft.

Perry County: E. M. Self 1 Schwind, SW SW SW 5-4s-1w, dry, TD 1,317 ft.

Shelby County: L. Marach 1 Wooters, SW SE SW 21-13n-2e, dry, TD 510 ft.

White County: C. E. Brehm 1 Stocke, NE NW SE 29-4s-9e, dry, TD 3,425 ft.

INDIANA WILDCAT FAILURES

Gibson County: Inland Producers 1 Blood, SW SW NE 14-3s-13w, dry, TD 2,814 ft.

George & Wrather 1 Michel, SE NW NE 25-3s-10w, dry, TD 2,100 ft.

Knox County: Geo. S. Engle 2 Mutz, SE NW SE 19-1n-11w, dry, TD 2,253 ft.

The Texas Co. 1 Giltnek, SW NW NE 16-5n-10w, dry, TD 1,615 ft.

Perry County: Snyder & Vickers 1 Zogleman, NE NW NE 1-5s-4w, dry, TD 760 ft.

Pike County: Graham Development Co. 1 Crecelius, SW NE NE 25-1s-9w, dry, TD 1,500 ft.

J. C. Haynes 1 Dillon, NE NE NW 14-1s-7w, dry, TD 2,621 ft.

Spencer County: Joe Bauder 1 Wittman, SW SW NE 30-5s-4w, dry, TD 1,055 ft.

Otto Wulfan 1 Fee, NE SW SE 19-4s-4w, dry, TD 950 ft.

Vigo County: Midwest Drilling Co. and Machine 1 Anderson, NW NE NE 16-11n-10w, dry, TD 2,155 ft.

WESTERN KENTUCKY WILDCAT FAILURES

Henderson County: Illey B. Browning 1 Galloway heirs, NE NW NE NW 23-O-23, dry, TD 1,897 ft.

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Geo. Engle 2 L. Parker, SE NW SW NE 21-P-24, dry, TD 2,463 ft.

Hopkins County: Blackwood & Nichols 3 Colonial Coal, SE NE NE SW 18-J-23, dry, TD 1,599 ft.

Blackwood & Nichols 4 Colonial Coal, W½ NW NE NE 13-J-23, dry, TD 683 ft.

Blackwood & Nichols 1 Pittsburg & Midway Coal, WL SW NE NE 13-J-23, dry, TD 2,550 ft.

Blackwood & Nichols 2 Colonial Coal, NW SW NE SW 8-J-23, dry TD 2,475 ft.

Stanford Oil Co. 1 E. T. Boggess, SE SW NW SW 23-L-25, dry, TD 3,032 ft.

McLean County: E. J. Walters 1 Hull estate, NE SW NW NE 19-M-27, dry, TD 2,623 ft.

MICHIGAN SUCCESSFUL WILDCATS

Barry County, Thornapple Township: Henry R. Fothergill 1 Myers & Myers Comm., SE NE NE 4-4n-10w, Traverse 1,949 ft., 1 bbl., TD 1,956 ft.

Kent County, Tyrone Township: James J. McGerry, Trustee & McClure Oil Co. 1 Emorey, SE NW SE 10-10n-12w, Traverse 2,376 ft., 15 bbl., TD 2,383 ft., PBTD 2,382 ft.

MICHIGAN WILDCAT FAILURES

Allegan County, Cheshire Township: George W. Miller 1 Grant, W½ E½ W½ 27-1n-14w, Traverse 1,269 ft., dry, TD 1,277 ft.

Laketown Township: Rex Oil & Gas Co. 1 Mize, NW NW NW 35-4n-16w, Traverse, 1,400 ft., dry, TD 1,460 ft.

Kent County, Sparta Township: Clarence N. Crawford 1 Anderson, NE NE SE 28-9n-12w, Traverse, 2,235 ft., dry, TD 2,336 ft.

Midland County, Edenville Township: Sun Oil Co. G-2 State-Edenville, SW SW NE 6-16n-1w, Marshall 1,331 ft., dry, TD 1,478 ft.

Ottawa County, Zeeland Township: Paul E. Cholette, Trustee 1, Ter Haar, NE NW NE 27-5n-14w, Traverse 1,558 ft., dry, TD 1,586 ft.

Louisiana-Ark.

Lafayette County Has New Discovery in Prospect

SHREVEPORT.—The second oil discovery in two weeks is apparent at a wildcat 1½ miles southwest of Patton in Lafayette County, Arkansas. McAlester Fuel Co. 1-A J. B. and P. D. Burton, C NE EW NE 36-17s-25w, recovered 120 ft. of oil and 90 ft. of oil and gas-cut mud on a 20-minute drill-stem test from 7,665-82 ft. in the Cotton Valley with no water cushion, using ⅜-in. top and ¼-in. bottom chokes. McAlester is the operator of the other discovery made in Lafayette County a week ago.

Austin E. Stewart is running low in the 1 O. A. Knighton, 200 ft. north and west of C SW NW 23-15s-23w, after drilling to 4,785 ft. at another Lafayette wildcat, 4¼ miles north and east of Stamps. The California Co. is coring below 3,920 ft. at 1 Elbert Fitzgerald et al, 508 ft. north and 604 ft. west from the SEc SW NE 27-16s-23w, 1½ miles southeast of Stamps. In Ouachita County McAlester Fuel Co. is coring below 2,624 ft. in the Pettit lime at 1-A Jennie McGaughy, NW NW 6-15s18w. In Union County Blackwell Oil and Gas Co. is drilling below 5,109 ft. at 1 G. D. Thurman, 4-20n-15w.

Near Horsehead field in Columbia County McAlester is drilling below 3,104 ft. in shale and sand at 1-A Foster-Grayson, 3-19s-20w. Deardorf Oil Corp. has recovered fish at 2,705 ft. and has set 10-in. casing and is drilling below 2,756 ft. at 1 Doggett, C NW NW 31-10n-3w, Jackson County. Lawton Oil Corp. is drilling below 3,180 ft. at 1-A Barbaree, C SE NE 14-14s-23w, Nevada County.

LOUISIANA WILDCAT FAILURES

Caldwell Parish: Placid Oil Co., 1 Louisiana Central Mineral Co., C SW NE 16-11n-4e, dry, TD 4,192 ft.

Catahoula Parish: Justiss-Mears Oil Co. 1 Tensas Delta-Monaghan Lumber Co. "C," C SE SE 28-9n-7e, dry, TD 5,796 ft.

Concordia Parish: Barnett Serio et al 1 Enlow-Forman, C SE NW 18-6n-8e, dry, TD 6,506 ft.

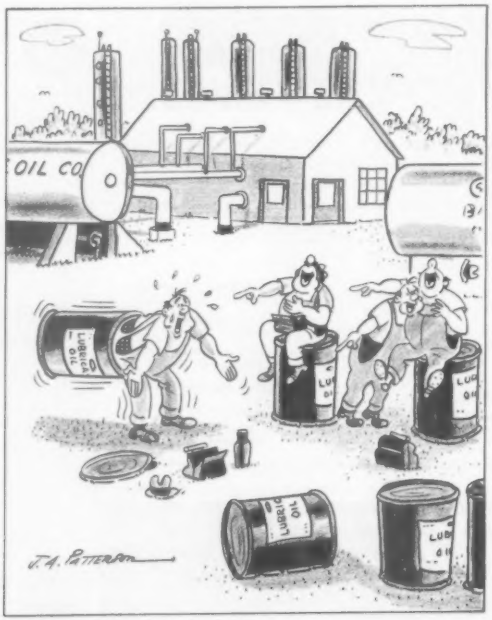
La Salle Parish: Hunt Oil Co. and Gulf Refining Co. 1 Louisiana Delta Lumber Co., C NE NW 18-5n-4e, dry, TD 6,010 ft.

Sabine Parish: Carter Oil Co. 1 Mansfield Lumber Co., C NE NW 3-6n-14w, dry, TD 6,500 ft.

ARKANSAS WILDCAT FAILURES

Lafayette County: Austin E. Stewart et al 1 Knighton, C SW NW 23-15s-23w, dry, TD 4,800 ft.

Ouachita County: McAlester Fuel Co. 1 McGaughy "A," 418 ft. N and 342 ft. E SWc NW NW 6-15s-18w, dry, TD 2,842.



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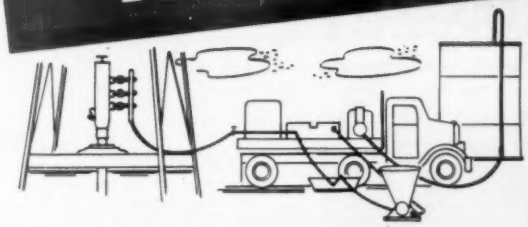

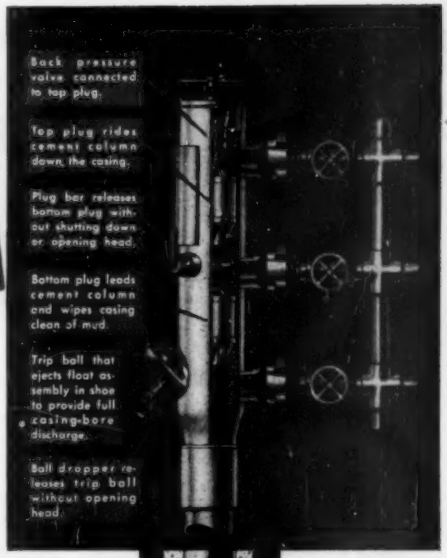
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Permian Basin

Andrews Reports Two Important Prospects

MIDLAND.—Northeast Andrews County had two important discoveries in the making last week. Phillips Petroleum Co. 1 University "CC" in 42-5-University Lands, 2½ miles northwest of Magnolia Petroleum Co.'s Devonian and Ellenburger discovery, had flowing oil on drill-stem test in the Devonian from 12,513-41 ft. Oil flowed in 63 minutes, was cleaned into pits for 5 minutes, then turned into tanks through 5/8-in. top and bottom chokes where it gaged 69 bbl. of 43°-gravity oil in 1 hour. It was to drill 50 ft. and test again.

Importance of the well is in its relation to Magnolia 1 University, which also had flowing oil in the Devonian, but completed in the Ellenburger. Phillips' well had top of the Devonian at 12,510 ft. on elevation of 3,034 ft., which was around 43 ft. high to the same marker in Magnolia's discovery. Phillips' well was drilled dry to 6,616 ft. a year ago and reentered following the Magnolia discovery.

The Texas Co. 1-Z State, Andrews County wildcat in 22-6-University Lands, some 6 miles northeast of Phillips 1-CC University, also had flowing oil from the Devonian, but was a failure in the Ellenburger. Total depth was 13,725 ft., plugged back to 12,597 ft. Perforations at 12,530-90 ft. were acidized, and after swabbing load water, the well flowed 257 bbl. of 44°-gravity oil through 20/64-in. choke in 14 hours. Top of the Devonian was 12,540 ft. Elevation had not been reported.

Magnolia 1-P TXL, 1½-mile northeast extension and second Ellenburger well in Davis (also called Pegasus-Spraberry) field of Upton County, was ready for completion. An 8-hour test on open-hole section at 13,127-87 ft., through 16/64-in. choke, gaged 90 bbl. of high-gravity oil.

In the same area, Magnolia 1-T TXL was drilling in shale at 8,025 ft., with no tests reported below 7,829-7,932 ft. which developed some gas-cut mud.

WEST TEXAS (DISTRICTS 8 AND 7-C) SUCCESSFUL WILDCATS

Glasscock County: Seaboard Oil Co. and Texas Pacific Coal & Oil Co. 1 S. J. Bishop, 31-32-T5S-T&P, TD 6,211 ft., elev. 2,686 ft., pay 6,130 ft., IP 413 bbl. 39°-gravity oil, 3/4-in. choke, TP 425 psi., GOR 777 cu. ft.

Kent County: Chapman & McFarlin Production Co. 1 D. M. Cogdell Jr., 775-97-H&TC, TD 7,633 ft., elev. 2,186 ft., Wolfcamp 4,538 ft., IP 286 bbl. 38°-gravity oil, ½-in. choke, TP 50 psi., GOR 404 cu. ft.

Runnels County: Edgar Davis Drilling Co. et al 1 Robert Spill, Blk. 534, J. C. McKean Sur., TD 4,477 ft., elev. 1,790 ft., pay 4,385 ft., IP 322 bbl. 46°-gravity oil, ½-in. choke, TP 120 psi., GOR 420 cu. ft.

George Callihan 1 L. Tinkle, Sec. 333, H&TC, TD 4,199 ft., elev. 1,809 ft., pay 4,184 ft., IP 177 bbl. 46°-gravity oil, 16/64-in. choke, GOR 1,450 cu. ft. TP 400 psi.

Geochemical Surveys, Inc. 1-R Harris, J. V. Cabrera Sur. 514, TD 3,920 ft., pay 3,867 ft., IP 153 bbl. 44°-gravity oil, TP 525 psi., GOR 1,850 cu. ft.

Sutton County: Phillips Petroleum Co. 1-A Libb, 52-14-TW&NG, TD 5,489 ft., elev. 2,223 ft., gas pay 3,976 ft., IP 13,000,000 cu. ft. of gas, ½ bbl. distillate, TP 1,065 psi.

WEST TEXAS (DISTRICTS 8 AND 7-C) WILDCAT FAILURES

Crane County: Chas. F. Garlitz 1-A King, 27-X-CCSD&RGNG, dry, TD 3,214 ft.

Loving County: Easterwood & Mayo 1 W. D. Johnson Jr., 12-57-T1-T&P, dry, TD 3,163 ft., Delaware lime 3,092 ft., sand 3,135 ft.

Pecos County: Williams Drilling Co. 1 J. T. McElroy, 126-10-H&GN, dry, TD 1,870 ft.

Reagan County: B. B. Carter Drilling Co. 1 Carter, 79-2-T&P, dry, TD 6,107 ft., elev. 2,432 ft., Spraberry 5,150 ft.

Texas Gulf Producing Co. 1 University, 9-7-University, dry, TD 3,091 ft.

Reeves County: F. K. Campbell 1 Lynn Est., 30-56-PSL, dry, TD 3,260 ft., Delaware sand 3,105 ft.

Runnels County: Alaska Steamship Co. 1 J. A. Morrison, Sec. 23, A. Losoya Sur., dry, TD 4,084 ft.

E. B. Fletcher 1 McWilliams, T. J. Hardeman Sur. 267, dry, TD 4,599 ft.

Tex Mex Drilling Co. 1 O. C. Pruser, GC&SF Sur. 615, dry, TD 4,346 ft.

Schleicher County: Earl Fain Jr. 1 Grace O'Harrow, 54-1-GH&SA, dry, TD 6,204 ft., elev. 2,337 ft., Palo Pinto 4,620 ft., Strawn 5,503 ft.

Tom Green County: Cities Service Oil Co. 1 Arnold Brenek, Sec. 169, L. P. Moore Sur., dry, TD 6,336 ft., elev. 1,884 ft., Ellenburger 6,136 ft.

Yoakum County: The Texas Co. 1 Tom Cobb, 224-D-J. H. Gibson Sur., dry, TD 12,168 ft., elev. 3,831 ft., Mississippian 11,394 ft., Devonian 12,112 ft.

TEXAS PANHANDLE (DISTRICT 10) WILDCAT FAILURES

Hartley County: Kerr-McGee Oil Industries 1 Coy Holt, 57-CS-PSL, 6 miles NW Channing, dry, TD 4,122 ft.

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Wheeler County: Gulf Oil Corp. 1 Redding, 21-A5-H&GN, strat test 5 miles NW Wheeler, dry, TD 4,489 ft., elev. 2,604 ft.

SOUTHEAST NEW MEXICO

Tide Water Associated Oil Co. completed 1 H. T. Monteith as a 2-mile northwest extension to East Lovington-Strawn field of Lea County. Daily potential of 754 bbl. of 42°-gravity oil was based on a 21-hour flow of 660 bbl. through ¾-in. choke. Perforations were from 11,256-80 and 11,300-16 ft.

In Eddy County, Richardson & Bass 1 Cobb-Federal recovered 555 ft. of slightly oil and gas-cut mud on a 20-minute drill-stem test from 7,056-7,154 ft. Operators were coring ahead below 7,154 ft.

SOUTHEAST NEW MEXICO WILDCAT FAILURES

Lea County: Mid-Continent Petroleum Corp. 1 State Land 13, 26-11s-32e, dry, TD 10,946 ft., elev. estimated 4,346 ft., Mississippian 10,388 ft., Devonian 10,870 ft.

Signal Oil & Gas Co. 1 W. M. Wafker, 31-19s-38e, dry, TD 4,213 ft.

South Louisiana

Drill-Stem Test Run at Beauregard Prospect

NEW ORLEANS.—Four miles northwest of Fulton, Beauregard Parish, Magnolia Petroleum Co. has reported running a drill-stem test on 1 Long-Bell "E" for a flow of 49 bbl. of oil plus 40 bbl. of saltwater on ¾-in. by 7/64-in. chokes. Well, bottomed at 9,296 ft. with 5½ in. casing set at 9,295 ft. and packer set at 8,796 ft., flowed through perforations from 8,824-30 ft. Working pressure was 1,875 psi. gas-oil ratio of 7,226 to 1, and 46.5° gravity. After killing well and pulling tool, operator squeezed the perforations with 75 sacks and is reported preparing to take additional tests at the same interval after reperforating with 24 shots. Location of the well is in Section 10-6s-9w.

A flow of 49 bbl. of 51.2-gravity distillate plus 2,525,000 cu. ft. of gas daily on a 12/64-in. choke has been reported by Hassie Hunt Trust on 1 Joseph Marcello, new gas-distillate discovery in Lafourche Parish. Bottomed at 13,760 ft., well has 5-in. casing cemented at 12,001 ft. Discovery flowed through perforations from 9,580-86 ft. with 3,250 psi. tubing pressure, gas-liquid ratio 51,530 to 1 and 51.2° gravity.

Well is located approximately 4 miles southeast of Thibodaux in Section 59-15s-17e.

Phillips Petroleum Co. is reported to be continuing to test its gas discovery in Terrebonne Parish 1 Continental Land & Fur Co., with latest test flowing 1,860,000 cu. ft. of gas daily with a trace of distillate on a 10/64-in. choke. Pressure gage was not available for the test which flowed through perforations at 9,240-46 ft. Bottomed at 12,283 ft., well has 9⅝-in. casing cemented at 9,500 ft.

Previous test, through the same interval, well flowed at a rate of 2,750,000 cu. ft. of gas daily on a 17/64-in. choke with tubing pressure registering 3,100 psi.

Location is in Section 24-18s-14e. Nearest production is Bayou Penchant gas field, located about 5 miles southwest.

SOUTH LOUISIANA SUCCESSFUL WILDCAT

Allen Parish: Richardson & Bass, 1 Shell-Luma Darbonne, 19-5s-3w, 24 hour test

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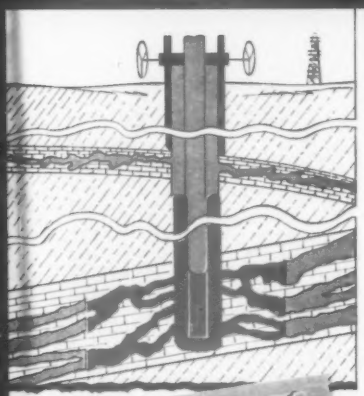

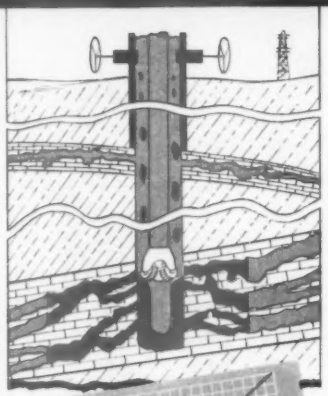

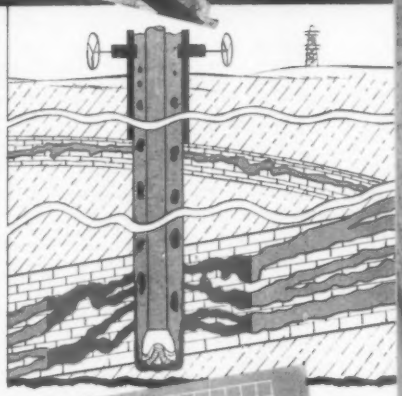

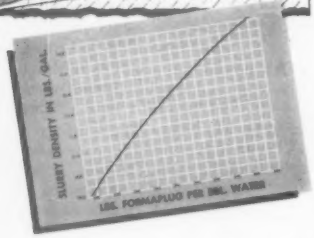

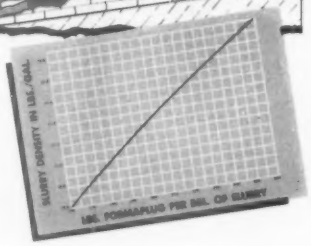

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flowed 143 bbl. daily, plus 67 BSW, plus 56 M.c.f. on 9/64-in. choke, GOR 3,940-1, 48° gravity TD 16,070 ft., TD PB 11,992 ft., T/pay, 11,976-986 ft., pay zone Wilcox.

SOUTH LOUISIANA WILDCAT FAILURES

Beauregard Parish: Kingwood Drilling Co., 1 Frances Caraway, 17-3s-6w, 6 miles S of Pitkin Townsite, dry, TD 9,590 ft.

LaFourche Parish: The California Co. 1 Alton Jone et al, 19-17s-23e, Little Temple area, dry, TD 12,685 ft.

Livingston Parish: Freeport Sulphur Co. 1 E. Crousel Est., 37-9s-4e, 6½ miles W of Maurepas Townsite, dry, TD 9,582 ft.

St. Landry Parish: Natural Gas & Oil Corp., 1 David Taylor, 22-3s-4e, 4 miles E of Morrow Townsite, dry, TD 12,595 ft.

Sunray Oil Corp., 1 Simon Lalonde, 116-6s-4e, 3 miles SE of Opelousas, dry, TD 10,581 ft.

Rocky Mountain

Week's Activity Almost Unprecedented in Region

DENVER.—Developments of major importance are testing in at least three of the Rocky Mountain region's major basins following a week of activity almost unprecedented in regard to drilling in the region.

Topping oil developments in the Rockies was the latest one, and perhaps the most important for Wyoming during the year—the discovery of Tensleep oil at G. H. Vaughan Production Co.'s 1 Unit, SW NE NW 11-15n-91w in Carbon County, Wyoming.

Test of oil in the Tensleep marks the southernmost from this horizon in the state. Tensleep is perhaps the most prolific formation in Wyoming, and is of major importance in other fields in the Green River basin notably at Hatfield, Wertz, and Lost Soldier.

The well is a deepening of a hole suspended at 8,805 ft. in Sundance last year by Sinclair Oil & Gas Co. A 50-50 farmout arrangement was made for the unit before deepening operations began. On test of the zone 10,226-256 ft. the well made an estimated 4,575 ft. of green, 45°-50°-gravity oil on 65-minute test. The pipe began to unload after the 64th stand was broken out, and the pipe was cleared by reverse circulation. No evidence of water was noted on the test. Flowing pressure was 1,058-1,668 psi., and shut-in pressure after 40 minutes was 4,665 psi.

Tensleep was hard and tight, with extensive fracturing reported. The operator is coring below 10,260 ft. Top of the formation was at 10,210 ft.

In the Denver-Julesburg basin of Colorado and Nebraska two apparent discoveries were added this week in continuation of a flurry of new finds which began more than a week ago. Rogers Oil Co. of Scottsbluff, Nebraska, recovered 600 ft. of 42.5°-gravity oil on 2-hour drill-stem test of the "D" sand at 1 Schrach, SE SE SE 34-14n-56w, Kimball County, Nebraska. Test was on the zone 6,408-38 ft. with gas at surface after 45 minutes. The wildcat is about 8 miles south and slightly west of the town of Kimball.

Another Kimball County discovery was made by James P. Sloss, San Antonio independent, who tested 550 ft. of oil and 200 ft. of heavily-oil-cut mud from the "J" sand at 1 State, SE SW SW 16-14n-54w. Sloss logged "J" sand at 5,994 ft. and test was of the zone 6,001-09 ft. The operator is running casing.

In Logan County, Colorado, F. Kirk Johnson and Dunn & Boreing are running casing on their discovery at 1 State, SE SE NE 31-8n-50w, after test of each of two "J" sand zones made 6,000,000 cu. ft. per day. The operator will try for completion in a 7-ft. section which will apparently produce oil, rather than in the gas sands.

In Montana Shell Oil Co. announced completion of 1 Little Beaver, C NE SW 13-4n-61e, Fallon County wildcat, and the southernmost discovery along the Baker-Glendive anticline. The well made 280 bbl. of fluid per day, of which 246 was oil.

Farther north, a confirmation test of the Shell Oil discovery at Pine Unit, Wibaux County, gaged 902 bbl. of fluid per day, of

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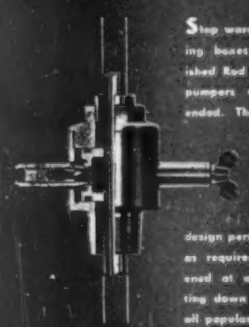

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which 893 was oil, a better completion than that of the discovery well.

In the Cedar Creek area, Dawson County, The Texas Co. is running casing for production tests of its apparent new pool opener, 1 NP "G" (NCT-4), C SW SW 23-17n-53e, which showed for production from 10,004-100 ft. with a recovery of 2,880 ft. of clean oil on drill-stem test.

Shell announced completion of three Richey area extension wells in Dawson and McCone counties. These were 24-18 Schock, NW SE SW 18-23n-50e, completed for a flow of 484 bbl. of fluid daily, of which 278 bbl. was oil. Test was on 28/64-in. choke. 31-25 E NPRR, SE NE NW 25-23n-49e, was completed for 164 bbl. of fluid per day, 69.4 per cent cut for a net oil recovery of approximately 50 bbl. daily. Shell's 42-24 E. Berry, C SE NE 24-23n-49e, completed for a gage of 295 bbl. per day, 1/10 of 1 per cent cut. This well had a calculated potential announced by Shell after test of several zones of 5,375 bbl. daily.

Southeast of Richey Oceanic Oil Co. of Los Angeles has a failure at 1 Casterline, C NE NE 4-22n-50e. The wildcat was drilled on a farmout from Shell, and is 4 miles southeast of the Richey pool opener.

Northeast of Richey, Shell had potentially important shows at 22-29 Etzel, SW SE NW 29-6n-51e, Richland County wildcat. A recovery of 240 ft. of gassy mud with show of oil was logged on 90-minute drill-stem test, with tool partially plugged for 25 minutes. Shell is attempting new test of the zone 6,685-6,734 ft.

In North Dakota Amerada Petroleum Corp. is testing a possible new pool opener south of Beaver Lodge and north of the Croff area discovery in McKenzie County. This wildcat swabbed 113 bbl. of oil and 58 bbl. of water in 18 hours from perforations 8,998-9,042 ft. with water recovery diminishing.

Also of North Dakota interest is the staking of the first wildcat in a projected series by Continental Oil Co. in Burleigh County. The company will drill 1 McCoy, NW NW NW 32-137n-76w, first solo operation by Continental in North Dakota for some time.

Montana had eight wildcat locations for the week, some of them of strategic importance. Hunt Oil Co. will drill its first venture of the current Williston basin play in Montana at 1 Hagan, C NE NW 7-34n-52n, Sheridan County. Marigold Oil, Ltd., made location for 1 Farnham, C SW SW 14-25n-48e. Other wildcats were located in Dawson, McCone, Fergus, Blaine, and Carbon counties.

Wyoming had 10 new wildcat wells, with the majority of them in the Wind River and Big Horn basins. Outside this area, a 7,000-ft. Eocene test announced by Shell in the Shell Creek area of Sweetwater County is of interest. The wildcat is 1 Shell Creek unit, C NE NE 36-14n-97w.

WYOMING WILDCAT FAILURE

Fremont County: Perry Fulk 1 Ben Roberts, SE SE SW 25-32n-9?w, dry; TD 1,235 ft. Tensleep 1,190 ft.

COLORADO SUCCESSFUL WILDCAT

Logan County: Shell Oil Co. 1 Knifton, NW NW NW 23-8n-53w, flowed 96 bbl. of oil and 3 bbl. water with 226,000 cu. ft. gas per day through 48/64-in. choke; TD 5,253 ft. PB to 4,822 ft., Dakota discovery — new field. Dakota 4,756 ft. and Morrison 5,204 ft.

COLORADO WILDCAT FAILURES

Jackson County: Continental Oil Co. A-6 Pollack, C NW SW 2-9n-79w, dry; TD 6,180 ft., granite 6,170 ft.

Logan County: Morris Mizel 1 Sonnenberg, SE SE NE 34-7n-51w, dry; TD 5,012 ft., "J" sand 4,876 ft.

Moffat County: Zephyr Drilling Co. 1 Government, C SW SW 32-4n-103w, dry; TD 1,305 ft., Weber 1,152 ft.

Nelson & Edward Morris, Ltd., 1 Biskup, SE SE NE 18-6n-90w, dry; TD 3,234 ft. Mancas 2,964 ft.

WESTERN NEBRASKA WILDCAT FAILURES

Cheyenne County: Ohio Oil Co. 1 L. & R. Tobler, SW NE NW 22-14n-50w, dry; TD 4,969 ft., third Dakota 4,884 ft.

R. C. Gangwer & Co. et al 1 Aude, NW NW NE 20-15n-52w, dry; TD 5,510 ft., "J" sand 5,444 ft.

Ohio Oil Co. 1 Niebuhr, NW NE NE 28-16n-50w, dry; TD 4,965 ft., "J" sand 4,900 ft.

Dawes County: Hunt Oil Co. 1 Pilsier, NE NE NE 17-33n-51w, dry; TD 4,196 ft., granite wash 4,196 ft.

Hunt Oil Co. 1 Johnson, C SE SE 32-34n-51w, dry; TD 3,007 ft. (no cores or tests).

Dundy County: Deep Rock Oil Corp. 1 Reining, SW SW NW 20-2n-37w, dry; TD 5,135 ft., pre-Cambrian 5,128 ft.

Garden County: True & Brown 1 Eldred, NE NE SW 25-20n-46w, dry; TD 3,913 ft., Fuson 3,673 ft.

Lincoln County: Paul Johnson 1 Darling, SW SW NW 22-12n-30w, dry; TD 2,834 ft., Pennsylvanian 2,465 ft.

Sheridan County: Shell Oil Co. 1 Jaeggers, SE SE SW 1-27n-46w, dry; TD 3,066 ft. Spearfish 3,033 ft.

Shell Oil Co. 2 Jaeggers, SE SE NE 22-28n-46w, dry; TD 2,764 ft. Spearfish 2,721 ft.

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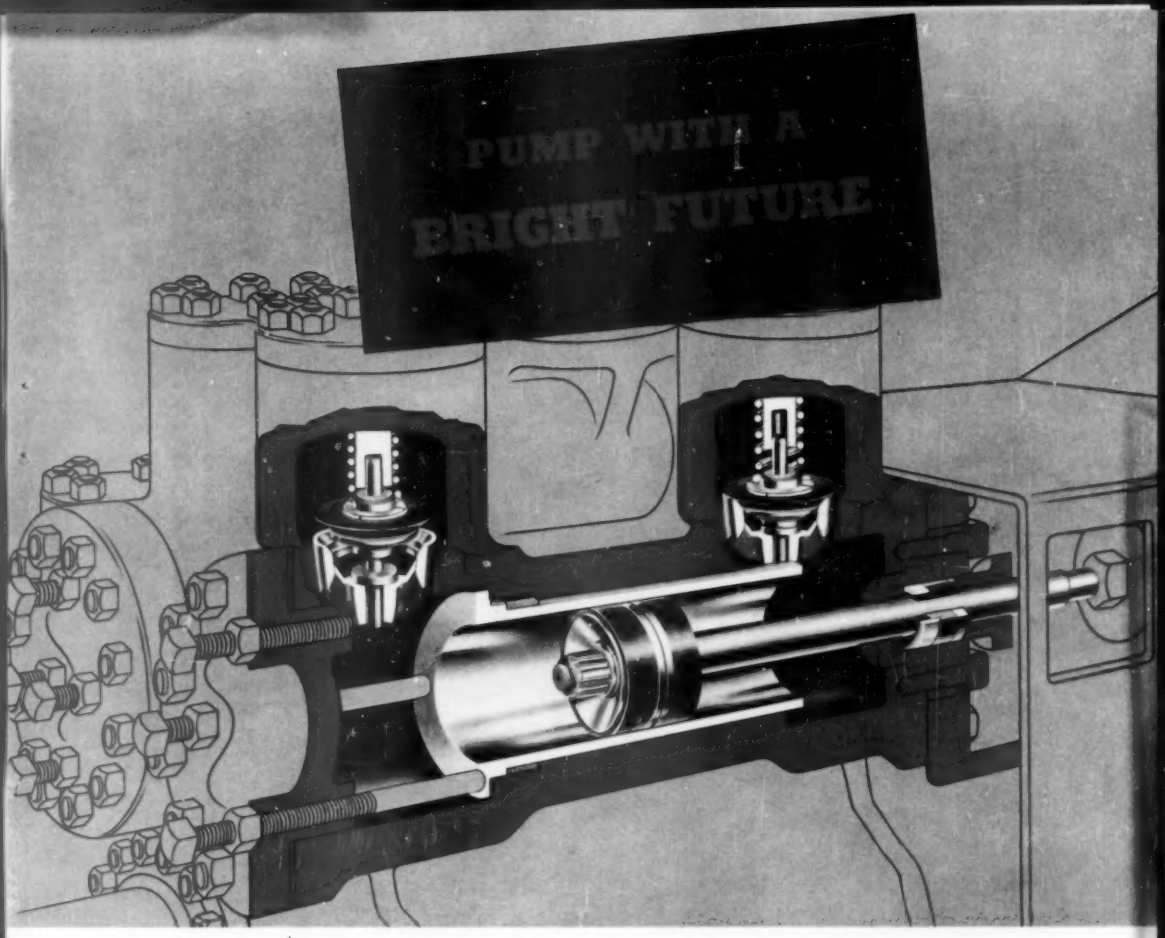

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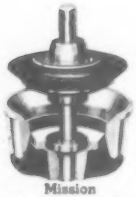

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UTAH WILDCAT FAILURES

Uintah County: The California Co. 1 Unit, SE SW NE 30-6s-22e, dry; TD 8,945 ft. Wasatch 6,730 ft.

Shell Oil Co., 33-4-Government, C NW SE 4-8s-23e (SIM), dry; TD 6,140 ft. Wasatch 5,635 ft.

MONTANA SUCCESSFUL WILDCAT

Fallon County: Shell Oil Co. 1 Little Beaver, C NE SW 13-4n-61e, pumbped 280 bbl. fluid per day, cut 12 per cent; TD 8,553 ft., Silurian 7,853 ft. Stoney Mountain 8,246 ft., Red River 8,300 ft. Ordovician discovery—new field.

NORTH DAKOTA WILDCAT FAILURES

Ward County: Wanette Oil Co. 1 M. O. Lee, C NE NE 24-156n-85w, dry; TD 10,137 ft. Jefferson 6,971 ft.

Williams County: Williston Basin Oil Venture, Inc., 1 Hugh Palmer-Swanson, C SW SE 10-156n-96w, dry; TD 8,794 ft. Madison 8,493 ft.

Oklahoma

Morrow Sand Discovery Indicated in Beaver County

BIG news in Oklahoma last week was Deep Rock Oil Corp.'s indicated new Morrow sand discovery at a wildcat 8 miles south and 5 miles east of Beaver in Beaver County.

Deep Rock's indicated strike, 1 Shadden "A," C NE NW 25-3n-24ecm, projected 9,850-ft. test, recovered 180 ft. of oil plus 30 ft. of gas and oil-cut mud on a drill-stem test of the Morrow sand from 7,318-32 ft. Flowing pressure was 300 psi. and bottom-hole shut-in pressure 2,000 psi. Following the test, the crew drilled ahead below 7,351 ft.

Northeast of Beaver, Sinclair Oil & Gas Co. is proving an apparent gas discovery. The 1 Maple, C SW NE 26-5n-24ecm, flowed 3,330 M.c.f. of gas daily from open hole at 6,495-6,548 ft. after acidizing. Well was shut in and crews are preparing for a new test.

South of Beaver County's Greenough pool Carter Oil Co. was testing in the upper Marmation at 1 Dorman, C NW NW 29-5n-22ecm. The well flowed 72 bbl. of 39.4°-gravity oil in 24 hours through a ¼-in. choke from acidized perforations at 5,590-92 ft. on the first test. On the following test the well flowed 40 bbl. of oil in 12 hours through a 5/32-in. choke with gas-oil ratio 650:1.

Just east of El Reno in Canadian County, central Oklahoma, Sinclair Oil & Gas Co. et al are continuing to penetrate into deep Simpson sand series at an indicated Wilcox sand gas discovery. The well is located in NW NE SE 14-12n-7w. A core at 1 Hutchiteman from 10,798-10,832 ft. gave up 34 ft. of sand with a slight show of oil in the top 3 ft. and in the lower 2 ft. Core hole was then reamed out to renew drilling, with no test being made. Most promising pay zone yielded 12,100 M.c.f. of gas daily on a test from 10,307-329 ft. Recovery was 30 ft. of distillate-cut mud in the Wilcox sand.

OKLAHOMA SUCCESSFUL WILDCATS

Lincoln County: A. R. Jordan Drilling Co. 1 Orr, NW NE NW 12-13n-2e, flowed 408 bbl. of oil from lower Skinner 4,592-4,601 ft., TD 4,623 ft.

N. V. Duncan 1 Grasgrin, SE SE NE 35-16n-3e, pumped 50 bbl. of oil from Red Fork 4,224-31 ft., TD 4,376 ft.

Okfuskee County: Wilcox Oil Co. 1 Tims, SW SE SE 28-13n-7e, pumped 50 bbl. of oil from Dutcher 3,637-60 ft., TD 4,395 ft.

OKLAHOMA WILDCAT FAILURES

Carter County: Gulf Coast Western 1 Dellener, SW NE NW 28-4s-1e, dry, TD 6,012 ft.

Garvin County: Shebester, Toland & Reeves, Inc. 1 Roy Hanks, SW SW NW 25-3n-3e, dry, TD 2,225 ft.

Jefferson County: R. E. Eckels and Christie-Stewart Drilling Co. 1 Trout, SW SW SE 9-6s-5w, dry, TD 3,408 ft.

W. F. Bush 1 I. C. McKinnis, SW SW 31-7s-6w, dry, TD 5,767 ft.

Kay County: Midstates Oil Corp. 1 Cannon, SW SW NW 26-28n-2w, dry, TD 4,644 ft.

Lincoln County: Culbertson & Vandenover 1 Johndahl, NE NE 3W 17-14n-2e, dry, TD 5,531 ft.

Jon Carson 1 Bunney, NW NE NE 26-17n-4e, dry, TD 4,276 ft.

Logan County: Harper-Turner Oil Co. 1 Hamlin, SE SE NW 17-15n-1w, dry, TD 6,119 ft.

Mitchell-Gage Drilling Co. 1 Breckenridge, C SW NE 7-16n-3w, dry, TD 6,349 ft.

Love County: Texas Pacific Coal & Oil Co. 1 Smallwood, SW NW SW 29-6s-3e, dry, TD 6,124 ft.

Noble County: D&L Oil Co. and Gardner Petroleum 1 Mildfelt, NE SE NE 10-21n-1w, dry, TD 3,695 ft.

Osage County Osage Producing Co. 1 Osage, SE SE NE 7-25n-9e, dry, TD 2,274 ft.

Pushmataha County: Chas. G. Rissler 1 Atterberry, NW NW NW 33-3s-16e, dry, TD 576 ft.

Stephens County: Wm. H. Atkinson 1 Binder, SE SW NE 9-3s-6w, dry, TD 2,300 ft.

Wm. H. Atkinson 1 Paxton, SW SE SE 9-3s-6w, dry, TD 2,400 ft.

Kansas

Oil Recovered At Finney Wildcat

IN Finney County W. J. Coppinger has recovered 2,250 ft. of oil and 3,500 ft. of gas at 1 Beyer, SE SE NW 24-26s-33w, a remote wildcat of the eastern edge of Hugoton gas field, increasing the possibilities of finding oil zones below the gas area.

A drill-stem test in the Lansing from 4,374-85 ft. recovered the oil and gas with 1,260 psi., bottom-hole pressure measured during the 40-minute test. Recovery on an earlier test from 4,292-4,306 ft., open 30 minutes, was 22 ft. of oil-cut mud with 950 psi. bottom-hole pressure.

Five-inch casing has been set at 4,332 ft., total depth, preparatory to testing Mississippian oil shows at Wycoff & Williams 1 Lundgren, NE NE SW 31-14s-29w, southern Gove County wildcat. The wildcat is located 1½ miles south of Lundgren pool. The oil was recovered on a drill-stem test of the interval 4,274-4,306 ft. in Mississippian. The test recovered 390 ft. of gas, 120 ft. of oil and 55 ft. of heavily oil-cut mud with 1,120 psi. bottom-hole pressure. Test was open 90 minutes.

Petroleum, Inc., is completing three discoveries in Kansas, 1 Tucker "A," NE NE SE 28-20s-13w, northeast of Hiss Southeast pool in Barton County, 1 Elmore "A," NW SE NW 23-17s-13w, and 1 Wilson "B," SE NE NE 1-15s-19w, Ellis County.

The company is installing pump at 1 Tucker "A." Final swab recovered 15 bbl. of oil hourly from 3,418-30 ft. in the Lansing. At 1 Elmore "A" operator is waiting on cable tools with 5-in. at 3,341 ft. Recovery on a drill-stem test from 3,340-45 ft. in Arbuckle was 55 ft. of oil-cut mud with 750 psi. bottom-hole pressure. The 1 Wilson "B" is waiting on cement with 5-in. casing set through the Lansing.

In north-central Stafford County Anschutz Drilling Co. 1 Bunselmeyer is being put on pump after swabbing 67 bbl. of oil in 2 hours. The pool opener is 1 mile west of Drach pool in NE NE NE 2-22s-13w, producing from the Arbuckle at 3,653-3,750 ft.

Imperial Drilling Co. has completed 1 Giebler, SE SE SW 27-13s-20w, Ellis County, for a pump potential of 304 bbl. of oil daily from the Arbuckle.

KANSAS SUCCESSFUL WILDCATS

Barton County: Rockett 1 Hawkins, NE NE NW 3-19s-13w, pumped 110 bbl. of oil from Arbuckle 3,394-3-409 ft., TD 3,409 ft.

Meade County: Skelly Oil Co. and Gulf Oil Corp. 1 Wilson, SW SW NE 4-34s-26w, flowed 11,200 M.c.f. of gas from Marmaton 5,723-34 ft., 5,751-70 ft., TD 5,870 ft.

Rooks County: Champlin 1 Bringardt, SE SE SE 35-10s-17w, pumped 233 bbl. of oil from Lansing-Kansas City 3,194-3,210 ft., TD 3,601 ft., PBTD 3,250 ft.

Champlin 1 Fehnel, NW NE SW 16-10s-19w, pumped 245 bbl. of oil from Lansing-Kansas City 3,480-94 ft., TD 3,729 ft. PBTD 3,525 ft.

Sedgwick County: J. P. Gaty 1 Gehring, CEL NE SW 16-28s-2e, pumped 5 bbl. of oil from Mississippian 2,986-3,011 ft., TD 3,019 ft., PBTD 3,011 ft. (Rock-Gehring pool).

KANSAS WILDCAT FAILURES

Barton County: B&R 1 Nuss, SW SE NE 6-16s-14w, dry, TD 3,400 ft.

Lindas 1 Kliewer, NW NW NE 1-20s-15w, dry, TD 3,666 ft.

Butler County: Rex & Morris and CRA 1 Anderson, SE SE SW 29-26s-3e, dry, TD 3,265 ft.

Cheyenne County: Deep Rock Oil Corp. 1 Clark, SW SW SW 23-1s-42w, dry, TD 5,632 ft.

Decatur County: Anderson-Prichard 1 Wennihan, SE SE NE 7-3s-26w, dry, TD 3,995 ft.

Ellsworth County: L. Phillips 1 Harman, SE SE SW 29-16s-8w, dry, TD 3,306 ft.

Ford County: I. W. Seigel 1 Lutz, SW SW NE 23-29s-26w, dry, TD 5,105 ft.

Graham County: Prime Drilling Co. and Davis Bros. 1 Lindenman, SW SW SE 5-7s-25w, dry, TD 4,250 ft.

Hodgeman County: Victor Drilling Co. 1 Dumler, NW SE NE 9-21s-26w, dry, TD 4,928 ft.

GMR 1 Ruff, NW NW SW 24-22s-22w, dry, TD 4,480 ft.

Logan County: B&R 1 Johnson, NE NE SE 10-11s-32w, dry, TD 4,800 ft.

Pratt County: Murfin I. Nesbitt, NE NE SE 11-26s-13w, dry, TD 4,440 ft.

Lion Oil Co. 1 Callahan, NW NW SE 33-26s-14w, dry, TD 4,637 ft.

Rooks County: GMR 1 Trible, NE NE SE 16-9s-20w, dry, TD 3,830 ft.

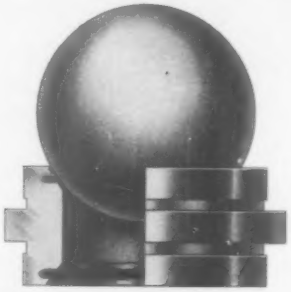
Cook and Galloway 1 Ordway, NE NE NE 17-10s-18w, dry, TD 3,790 ft.

Rush County: E. E. Adair-Graham 1 Folkerts, NE NE NW 18-19s-16w, dry, TD 3,875 ft.

Stafford County: Skelley & Miller, 1 Fair, SE SE SE 23-21s-11w, dry, TD 3,530 ft.

L. Phillips 1 Metz, SW SW SE 32-22s-13w, dry, TD 3,938 ft.

Sumner County: National Cooperative 1 Dennison, CSL S½ SE 10-31s-2w, dry, TD 4,360 ft.



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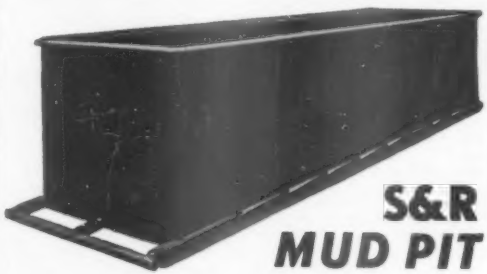

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July Completions Short of May's Record Number

by John C. McCaslin

JULY total completions were up 9 per cent over June to a substantial figure of 4,148 wells, just 16 below May's record 1952 levels. Total completions for July were up 9 per cent over last July.

Texas showed the greatest gain over June, up 27 per cent to a record total of 1,735 wells completed. Footage drilled in Texas totaled 8,403,826 ft. in July for a new record for any one month, despite the threatening effects of the recent steel strike. Operators drilled almost 17,000,000 ft. of hole in July in the United States, the third highest total for the year.

Total wildcat completions in July climbed to 963, an 18 per cent gain over June. A total of 127 wildcats were successfully completed for oil, 19 for gas, 817 dry. Total wildcat footage drilled was 4,198,820 ft. as compared to June's 3,737,648 ft. July's wildcat totals were up 4 per cent over last July.

California reported 46 wildcats completed in July, 6 of them successful, while Louisiana chalked up 7 new discoveries. Mississippi recorded two successful wildcats, completed in the Wilcox for oil. A total of 23 apparently commercial discoveries of oil and gas were reported from the Denver-Julesburg basin through July. New discoveries in Colorado and Nebraska during July totaled four. Two dry holes were recorded in North Dakota, one in South Dakota. Beaver Lodge field in North Dakota held the development limelight in July with seven completions reported.

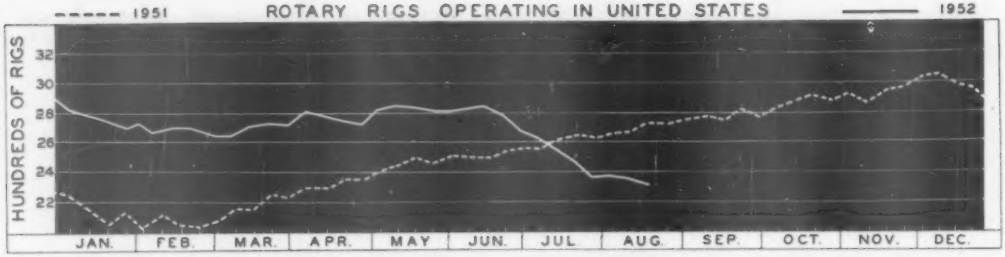
Cumulative total wildcat completions for 1952 in the United States show a 9 per cent gain over the same period last year. A total of 5,955 wildcats have been completed since January 1, 895 of them for oil, 145 of them for gas, and 4,915 recorded as dry holes. Cumulative wildcat footage drilled stands at 26,829,827 ft. as compared to 22,735,997 ft. last year. Completions for the January-July period of last year totaled 5,450, of which 827 were oil successes, 143 were gas wells, and 4,480 were dry holes.

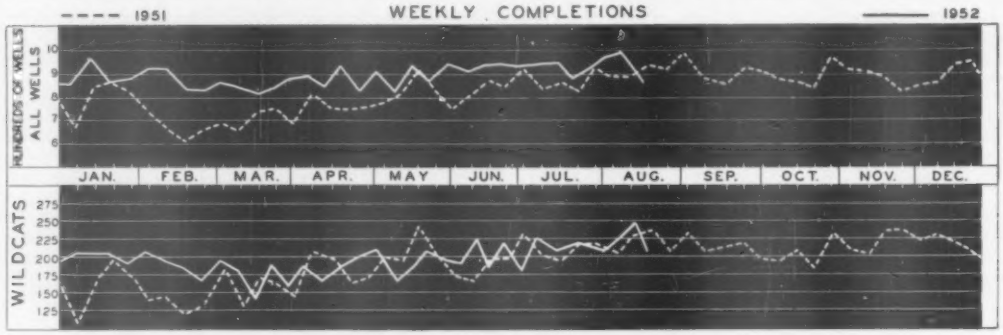
Cumulative total completions in the United States for 1952 now stand at 27,341, an 11 per cent increase over the same period last year. Footage drilled from January-July totals 112,760,889 ft., up 19 per cent over last year. Cumulative oil-well completions total 14,598, up 11 per cent; gas wells 1,837, up 12 per cent; dry holes 10,906, up 11 per cent.

SUMMARY OF COMPLETIONS, JULY 1952

	Total Comp.	Oil	Gas	Dry	Under 2,500 ft.	2,500-5,000 ft.	5,000-7,500 ft.	7,500-10,000 ft.	10,000-12,500 ft.	Over 12,500 ft.	Total footage	Rigs and drilling
New York	73	37	0	36	73	0	0	0	0	0	105,500	75
Pennsylvania	188	87	20	81	182	6	0	0	0	0	344,926	200
West Virginia	41	4	33	4	13	26	2	0	0	0	126,997	191
Maryland	3	0	2	1	0	3	0	0	0	0	10,755	18
Ohio	103	42	23	38	60	41	2	0	0	0	215,167	167
Kentucky	82	29	17	36	57	25	0	0	0	0	182,879	90
Illinois	218	70	1	147	91	125	1	1	0	0	557,871	266
Indiana	134	32	4	98	103	30	1	0	0	0	240,823	178
Michigan	68	30	2	36	33	31	4	0	0	0	186,411	131
Kansas	347	161	34	152	29	315	3	0	0	0	1,169,994	417
Nebraska	19	10	0	9	0	11	8	0	0	0	93,516	40
Oklahoma	399	217	14	168	104	211	64	10	10	0	1,498,096	788
Texas	1,735	1,002	81	652	400	572	467	228	52	16	8,403,826	1,351
N. Central (Dist. 7-B & 9)	580	293	7	280	224	266	90	0	0	0	1,874,912	351
West (Dist. 7-C & 8)	531	403	2	126	69	136	192	107	19	8	3,070,608	454
Panhandle (Dist. 10)	76	36	31	9	19	50	2	4	1	0	253,848	91
East (Dist. 5 & 6)	105	49	9	47	3	36	43	21	2	0	615,527	77
Gulf Coast (Dist. 2 & 3)	243	120	21	102	21	41	80	72	22	7	1,647,540	220
Southwest (Dist. 1 & 4)	200	101	11	88	64	43	60	24	8	1	941,391	158
Louisiana	198	113	15	70	52	30	27	31	41	17	1,308,683	252
North	101	57	5	39	49	26	23	2	1	0	342,776	102
South	97	56	10	31	3	4	4	29	40	17	965,907	150
Arkansas	23	11	0	12	4	17	1	1	0	0	80,705	37
Mississippi	33	10	0	23	0	3	20	7	1	2	243,133	37
Ala.-Ga.-Fla.	8	3	5	0	0	7	1	0	0	0	51,024	6
Montana	29	14	0	15	13	7	5	1	3	0	123,508	98
Wyoming	63	36	0	27	6	37	13	6	1	0	280,588	154
Colorado	41	12	1	28	0	10	29	2	0	0	229,342	58
Utah	6	2	0	4	0	1	3	2	0	0	37,516	37
New Mexico	107	54	32	21	25	34	12	22	8	6	598,647	218
California	203	156	4	43	70	76	45	7	5	0	769,837	255
North Dakota	10	7	0	3	0	1	1	8	0	0	79,821	37
Miscellaneous	§17	2	1	14	16	1	0	0	0	0	13,464	¶27
Total July 1952	4,148	†2,141	289	*1,718	1,331	1,620	709	326	121	41	16,953,029	‡5,128
Total June 1952	3,781	2,017	242	1,522	1,161	1,520	662	305	111	22	15,393,421	5,665
Total July 1951	3,790	1,914	258	1,618	1,292	1,583	608	203	88	16	14,329,455	5,549
Cumulative 1952	27,341	14,598	1,837	10,906	8,297	10,953	4,964	2,111	817	199	112,760,889	
Cumulative 1951	24,556	13,129	1,631	9,796	8,148	10,331	3,956	1,393	622	106	94,062,413	
Alberta, Canada:												
July 1952	142	79	13	50	14	68	59	1	0	0	611,208	
June 1952	143	79	14	50	20	63	56	3	1	0	619,046	
Cumulative 1952	887	521	70	296	111	345	414	13	4	0	3,905,102	

*Incl. 149 service wells: N. Y. 36, Pa. 74, Ohio 9, Ind. 7, Mich. 3, Kans. 2, Okla. 16, N. Cent. Tex. 2. †Incl. 37 condensate wells: Okla. 3, W. Tex. 4, E. Tex. 4, Tex. Gulf 7, S.W. Tex. 6, S. La. 9, Miss. 4. ‡Incl. all wells rigged up and/or drilling at month end. §Incl. Mo. 3, 1,510 ft., S. D. 1, 3,975 ft., Tenn. 13, 7,979 ft. ¶Incl. Mo. 5, Tenn. 11, S. D. 6, Ariz.-Idaho-Nev. 5.





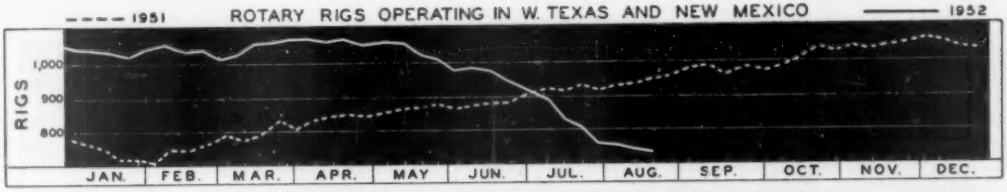
CURRENT STATISTICS

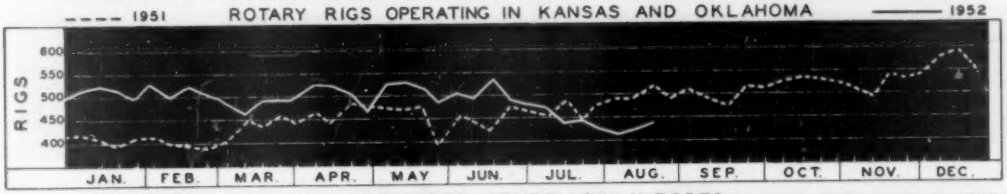
EXPLORATION

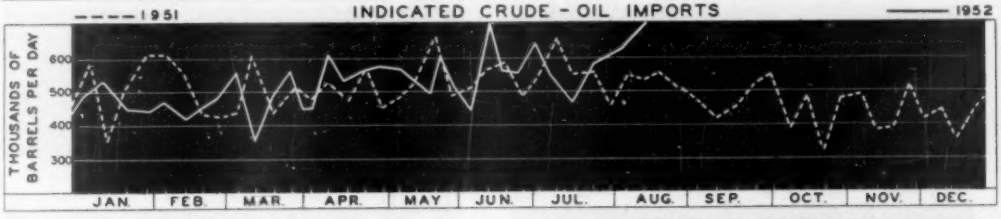
WEEKLY WELL COMPLETIONS . . . WEEK ENDED AUGUST 16, 1952

	Total of all wells							Wildcat completions and discoveries									
						Aug. 16							Cumulative total, 1952				
	Comp.	Oil	Gas	Dry	Footage	1952	1951	Oil	Dist.	Gas	Dry	Total	Oil	Dist.	Gas	Dry	Total
New York	18	9	0	*9	26,375	470	391	0	0	0	0	0	0	0	0	2	2
Pennsylvania	47	21	5	†21	86,200	1,190	1,014	0	0	0	0	0	0	0	0	2	2
West Virginia	11	4	6	1	24,389	391	354	0	0	0	0	0	0	0	2	4	6
Ohio	19	8	2	9	42,137	623	580	0	0	0	1	1	2	0	7	15	24
Indiana	29	8	0	21	55,289	778	751	0	0	0	10	10	22	0	2	220	244
Kentucky	31	9	9	13	67,329	812	714	0	0	0	8	8	15	0	1	154	170
Illinois	48	15	2	31	112,160	1,187	1,462	0	0	0	15	15	10	0	0	341	351
Michigan	10	2	0	8	16,648	448	468	2	0	0	5	7	21	0	4	153	178
Kansas	99	49	5	45	350,290	3,020	2,689	4	0	1	20	25	69	0	10	484	563
Nebraska	17	6	0	11	83,412	171	139	0	0	0	10	10	7	0	0	93	100
Oklahoma	124	61	7	‡56	430,598	3,717	3,429	3	0	0	15	18	73	2	8	384	467
Texas	264	165	17	82	1,322,809	11,270	10,105	19	0	3	49	71	503	36	77	2,407	3,023
North Central (Dist. 7-B & 9)	79	46	1	§32	264,478	3,546	3,072	10	0	0	21	21	277	1	23	1,015	1,316
West (Dist. 7-C & 8)	94	75	1	18	551,454	3,521	3,032	5	0	1	12	18	110	0	5	435	550
Panhandle (Dist. 10)	18	11	4	3	58,171	430	415	0	0	0	2	2	4	0	5	32	41
Eastern (Dist. 5 & 6)	13	5	1	7	68,805	602	753	0	0	0	4	4	15	3	2	142	162
Gulf Coast (Dist. 2 & 3)	38	21	4	13	244,041	1,658	1,427	4	0	1	4	9	55	22	18	344	439
Southwest (Dist. 1 & 4)	22	7	6	9	135,860	1,513	1,406	0	0	1	6	7	42	10	24	439	515
Louisiana	44	17	3	24	302,663	1,421	1,262	0	1	0	10	11	26	12	9	183	230
Northern	24	9	3	12	85,231	763	681	0	0	0	5	5	10	0	7	82	99
Southern	20	8	0	12	217,432	658	581	0	1	0	5	6	16	12	2	101	131
Arkansas	8	3	0	5	32,528	242	247	0	0	0	2	2	4	0	0	49	53
Mississippi	4	1	0	3	26,283	222	204	1	0	0	3	4	11	2	1	101	115
Southeastern States	1	1	0	0	6,190	41	35	0	0	0	0	0	3	0	1	23	27
Montana	8	7	1	0	41,080	182	129	1	0	0	0	1	4	0	1	41	46
Wyoming	9	7	0	2	37,162	442	434	0	0	0	1	1	18	0	3	69	90
Colorado-Utah	10	3	0	7	57,136	328	157	1	0	0	6	7	16	0	7	130	153
New Mexico	16	7	4	5	97,440	665	409	0	0	0	2	2	22	2	1	68	93
California	40	33	0	7	141,972	1,544	1,390	3	0	0	6	9	53	0	4	301	358
North Dakota	5	3	0	2	44,911	45	5	0	0	0	2	2	3	0	0	12	15
Miscellaneous (Md.)	2	0	2	0	6,403	49	64	0	0	2	0	2	0	0	18	18	37
Total United States	864	439	63	362	3,411,404	29,258	26,432	34	1	6	165	206	882	54	156	5,255	6,347
Total previous week	997	476	73	448	4,246,489			22	1	3	223	249	848	53	150	5,090	6,141
Total August 18, 1951	935	494	53	388	3,623,185			31	2	5	196	234	924	48	167	4,859	5,998

Service wells included: *9, †18, ‡6, §1.



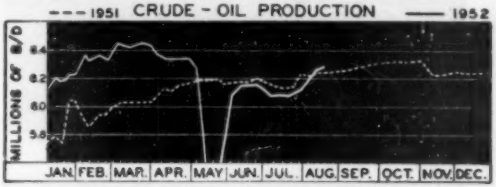


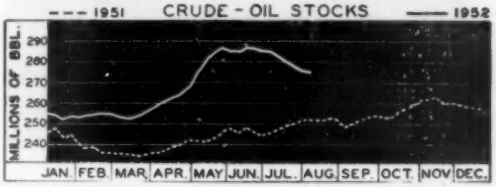


DAILY AVERAGE PRODUCTION FOR WEEK

	August 16, 1952			Aug. 9
	Crude oil	Lease condensate	Total	total
Alabama	2,900		2,900	2,850
Arkansas	79,200	4,150	83,350	79,600
California	984,000		984,000	982,500
Colorado	80,300		80,300	84,850
Eastern	59,600		59,600	59,500
Florida	1,650		1,650	1,725
Illinois	166,700		166,700	165,600
Indiana	33,300		33,300	32,900
Kansas	324,850		324,850	311,750
Kentucky	33,000		33,000	32,600
Louisiana	638,475	32,400	670,875	670,025
North	112,350	9,400	121,750	120,900
South	526,125	23,000	549,125	549,125
Michigan	36,800		36,800	37,600
Mississippi	92,700	3,700	96,400	96,150
Montana	27,000		27,000	26,900
Nebraska	7,050		7,050	6,950
New Mexico	160,600	300	160,900	161,000
Oklahoma	528,700		528,700	531,200
Texas	2,749,275	41,575	2,790,850	2,790,850
Dist. 1	33,175	125	33,300	33,300
Dist. 2	151,100	3,850	154,950	154,950
Dist. 3	446,850	24,000	470,850	470,850
Dist. 4	244,950	4,400	249,350	249,350
Dist. 5	45,200	200	45,400	45,400
Dist. 6	117,825	3,600	121,425	121,425
East Texas field	263,000		263,000	263,000
Dist. 7-B	98,000	50	98,050	98,050
Dist. 7-C	148,725	4,900	153,625	153,625
Dist. 8	939,875	200	940,075	940,075
Dist. 9	178,475	250	178,725	178,725
Dist. 10	82,100		82,100	82,100
Utah	4,400		4,400	4,300
Wyoming	183,000		183,000	183,000
North Dakota	5,000		5,000	4,500
Total U. S.	6,198,500	82,125	6,280,625	6,266,350
Change from previous week, up			14,275	
Canada	207,700		207,700	142,175
Total U. S. production January 1-August 16			1,398,082,425 bbl.	
Same period last year (crude plus cond.)			*1,392,449,900 bbl.	

*Includes 18,664,900 bbl. condensate.



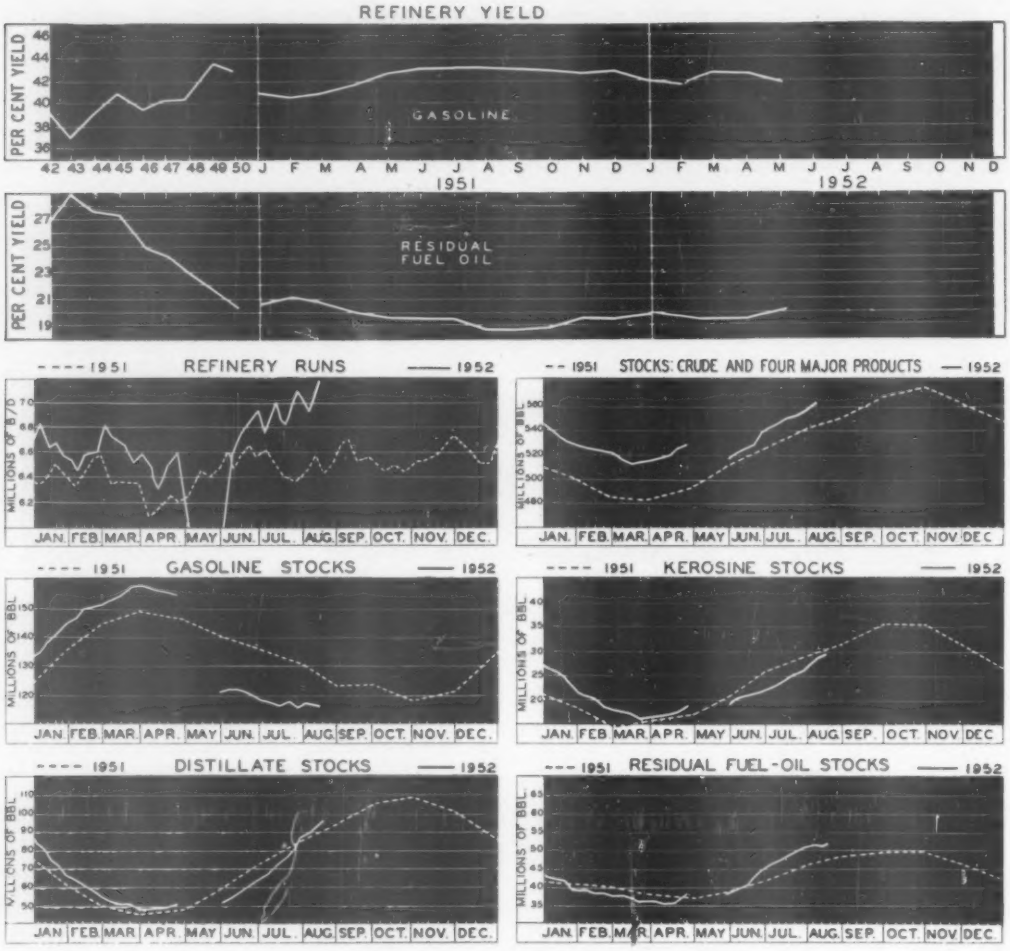


CRUDE-OIL STOCKS BY STATES OF ORIGIN*

(Thousands of barrels daily)

	Aug. 9, '52	Aug. 2, '52	Aug. 11, '51
Pennsylvania Grade	2,336	2,286	2,154
Other Appalachian	2,083	2,162	1,411
Illinois, Indiana, Michigan	12,997	13,226	10,633
Arkansas	3,048	2,983	2,884
Louisiana	15,588	14,907	14,607
North	2,533	2,308	3,341
Gulf	13,055	12,599	11,266
Mississippi	3,767	3,575	3,108
New Mexico	7,513	7,768	6,454
Oklahoma and Kansas	40,213	40,017	39,702
Texas	131,856	135,386	118,920
East Texas proper	12,824	13,199	(†)
West Texas	57,965	57,959	(†)
Texas Gulf	28,389	29,543	(†)
Other Texas	32,678	34,685	(†)
Rocky Mountain	15,443	14,426	13,663
California	31,715	32,027	30,005
Foreign	9,099	7,669	7,815
Total	275,658	276,432	251,356

*Bureau of Mines. †Not comparable with current week.

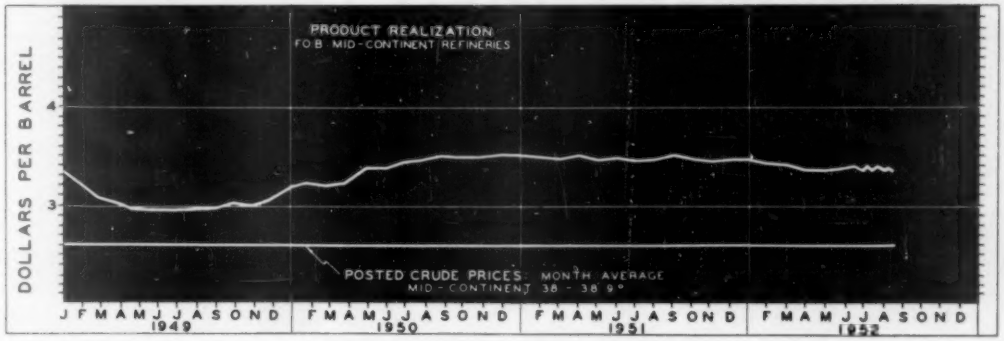


A.P.I. REFINERY REPORT, AUGUST 16

(Thousands of barrels)

District—	Daily avg. runs	Daily average production Gaso.*	Kero.	Dist.	Resid.	Stocks‡ Gaso.†	Kero.	Dist.	Resid.	Bureau of Mines, August 1951 Daily avg. runs	Daily average production Gaso.*	Kero.	Dist.	Resid.
East Coast	1,069	411.6	52.9	218.7	209.6	28,979	12,697	33,485	12,804	1,026	415.3	41.0	230.1	228.1
Appalachian:														
District 1	103	45.8	2.9	18.8	11.7	3,531	567	1,423	828	104	41.6	5.3	17.4	11.9
District 2	91	40.9	5.0	17.6	15.1	1,780	348	505	400	73	33.1	3.5	8.9	15.7
Ind., Ill., Ky.	1,344	688.6	75.6	240.0	163.0	24,459	6,455	19,574	6,452	1,203	640.4	69.9	197.2	150.5
Okla., Kans., Mo.	611	337.7	21.1	140.4	66.3	11,028	1,876	11,974	1,615	482	264.6	11.8	117.1	53.1
Inland Texas	270	179.0	13.1	47.6	41.1	3,975	447	1,880	1,111	256	173.0	12.5	39.2	41.5
Texas Gulf Coast	1,763	765.0	142.4	433.4	292.6	15,633	4,008	10,044	8,042	1,586	739.9	118.9	312.0	257.0
La. Gulf Coast	545	249.4	50.0	157.4	47.4	6,011	1,945	3,526	2,179	501	235.0	54.9	118.7	59.8
N. La. and Ark.	83	34.3	7.9	21.3	5.3	2,822	569	911	208	85	35.0	7.9	16.7	7.7
Rocky Mountain:														
New Mexico	18	10.6	0	2.9	3.9	98	0	71	30	16	9.0	.1	3.3	3.7
Other Rocky Mtn.	240	110.3	2.7	48.3	45.3	3,294	435	2,078	1,350	227	103.4	5.2	43.5	41.1
California	1,040	430.8	6.0	131.0	344.4	14,369	374	9,809	16,940	980	423.7	7.9	132.5	355.5
August 16, 1952	7,177	3,304.0	379.6	1,477.4	1,245.7	115,979	29,721	95,280	51,959	6,539	3,114.0	338.9	1,236.6	1,225.6
August 9, 1952	6,909	3,283.4	372.0	1,454.0	1,265.1	116,930	28,808	90,035	51,302					
August 18, 1951	6,470	3,075.1	356.7	1,227.6	1,206.0	126,286	31,329	88,721	48,293					

*At refineries including natural blended. †Finished and unfinished. ‡At refineries, bulk terminals, in transit, and in pipe lines.


PRODUCT REALIZATION
F.O.B. MID-CONTINENT REFINERIES
DOLLARS PER BARREL
4
3
POSTED CRUDE PRICES: MONTH AVERAGE
MID-CONTINENT 38 - 38.9°
J F M A M J J A S O N D
1949
F M A M J J A S O N D
1950
F M A M J J A S O N D
1951
F M A M J J A S O N D
1952

In this trend chart refinery realization is based on average Mid-Continent grade crude oil (not 38° gravity only) and average prices for refinery products as published in The Oil and Gas Journal basis Oklahoma (Group 3). Refinery yields confined to gasoline, kerosine, distillate and fuel oil. Realization averaged $3.33 for week ended August 9, $3.35 for previous week, and $3.48 for August 1951. The above trend information is based on volumes and current prices and therefore does not reflect changes in operating costs.

REPRESENTATIVE QUOTATIONS

Representative spot-market quotations of leading suppliers as of August 20, 1952. Figures are f.o.b. plant for tank-car shipments in cents per gallon, except for residual fuel oil which shows the price per barrel and wax, in cents per pound.

GASOLINE, KEROSINE, AND FUEL OILS

	Mid-Continent Group 3	New York Harbor (barge)	Texas Gulf Coast
Regular gasoline, 80-82 octane	10¾-10½	12.125-12.75	10¾-11
Premium gasoline, 86-88 octane	11⅜-11½	13.75-14.0	11¾-12
42-44 w.w. kerosine	8¾-9	10.65	9-9.25
No. 2 straw fuel oil	7¾-8	9.65	8-8.25
No. 6 residual	$0.90-1.00	$2.10-2.25	$1.50-1.75

NATURAL GASOLINE

	Group 3	North Texas	N. La
Grade 26-70	5¾	5¼	5½
Grade 18-55	6.9	6.3	6.65

LUBRICATING OILS
South Texas

200 vis., No. 2-3 neutral	13-13.5
750 vis., No. 3-4 neutral	16
2,000 No. 5-6 neutral	18-19

LUBRICATING OILS
Mid-Continent

150-160 vis., D bright stock, 0-10 pp.	27-28
200 vis., No. 3 neutral, 0-10 pp.	14.5-15.5

Western Pennsylvania

145-155 vis., 10 p.t. bright stock	32.5
180 vis., 0 p.t. neutral	31.5

WAX
Mid-Continent

132-134 A.M.P.	5.5

MOTOR fuels continue to be the strongest refinery product in both domestic and export markets. Prices were firm at the ranges which were generally established earlier in the summer. Market observers expect this situation to continue at least until the Labor Day week end, which is the climax of the summer season of maximum domestic gasoline consumption.

Natural gasolines, used largely as blending stocks for refinery gasolines, are also strong in all areas with 5¾ cents the accepted going market for Grade 26-70 in Oklahoma (Group 3). Some further improvement in the export demand for this product was reported over the past week.

The pre-fall buying of distillates has been disappointing to some sellers. This is explained as being partially due to the fact substantial increases in distillate stock over the past month have minimized the danger of shortages for the fall and winter season. In the Mid-Continent and Middle West a few sales under the going market were reported.

The lubricating oil market is spotted with prices generally unchanged for both Pennsylvania and western grades. Some improvement in industrial grade demands is reported reflecting expansion in activity since the steel strike with supplies adequate.

Probably the most important development over the past week in coastal markets was the strengthening in the tanker rates, amounting to approximately 10 per cent for late August and early September deliveries. Part of the price weakness in fuels, particularly in the case of residuals, this summer has been the drop in tanker rates, resulting in lower delivered prices at important distributing points along the Atlantic Seaboard and elsewhere. While a further seasonal increase in tanker rates is anticipated, the trade generally does not expect a return to the high rates in effect last winter and spring.

CRUDE PRICES
GRAVITY SCHEDULE

	Signal Hill, Calif.‡	Oklahoma, Kansas	Gulf Coast Tex.*	West Tex.†
18-18.9	$1.93			
19-19.9	1.98			
20-20.9	2.03	$2.25		$2.12
21-21.9	2.07	2.27		2.14
22-22.9	2.12	2.29		2.16
23-23.9	2.18	2.31		2.18
24-24.9	2.24	2.33	$2.56	2.20
25-25.9	2.30	2.35	2.58	2.22
26-26.9	2.36	2.37	2.60	2.24
27-27.9	2.41	2.39	2.62	2.26
28-28.9	2.46	2.41	2.64	2.28
29-29.9	2.52	2.43	2.66	2.30
30-30.9	2.57	2.45	2.68	2.32
31-31.9	2.62	2.47	2.70	2.34
32-32.9	2.68	2.49	2.72	2.36
33-33.9		2.51	2.74	2.38
34-34.9		2.53	2.76	2.40
35-35.9		2.55	2.78	2.42
36-36.9		2.57	2.80	2.44
37-37.9		2.59	2.82	2.46
38-38.9		2.61	2.84	2.48
39-39.9		2.63	2.86	2.50
40 and above		2.65	2.88	2.52

*For crude from Daboval, El Campo, and Sand Point.

†Includes Lea County, New Mexico. Last general price change represented a 50-cent increase becoming effective December 6, 1947.

‡Standard Oil Co. of California.

FLAT CRUDE PRICES

Representative posted schedules per barrel.	
Kettleman Hills, California*	$2.80
Louisiana:	
Beauregard Parish	2.60
Cotton Valley (distillate)	2.85
Cotton Valley (crude)	2.70
Texas:	
East Texas	2.65
Pecos County (Yates)	2.35
Conroe	2.83
Van	2.48
Pennsylvania Grade:	
Bradford	4.25
Southwest Pennsylvania	3.82
West Virginia	3.76
Illinois Basin	2.77

*37°-37.9°.

EQUIPMENT MEN . . . in the News

Jones & Laughlin Supply Announces Key Changes

Recent changes in personnel have been announced by J. L. Shakely, Jones & Laughlin Supply Co.'s president. Rainey Elliott has been elevated from director of sales to vice president and a director of the company.

L. George Sutter succeeds Elliott as director of sales.

Robert J. Woods, Jr., has been promoted from sales manager, J. & L. products, to assistant director of sales.

RAINEY ELLIOTT

L. G. SUTTER

James T. Batchelor, assistant sales manager, J. & L. products, Tulsa, has been appointed sales manager, J. & L. products.

R. J. WOODS

J. T. BATCHELOR

Oliver A. Bergmann, salesman, J. & L. products, has been appointed assistant sales manager, J. & L. products.

William R. Clarke moves from assistant chief engineer, machinery section, general products sales department, to chief engineer.

Robert E. Howe has been promoted from assistant to director of sales to sales coordinator, general sales department.

Elliott started in the oil-field supply business in June, 1930, going with J. & L. as local store manager at Electra, Tex., in 1935, later transferring to the East Texas fields as a field salesman, and still later to Dallas as city salesman. In 1941 he was moved to Tulsa, and promoted to sales manager, general sales department, continuing in this capacity until appointed director of sales in January 1952.

Elliott graduated from Texas Christian University with a business law degree in the class of 1930.

Sutter is a graduate of University of Oklahoma. Starting with J. & L. as a construction worker in 1926, he was promoted to a sales-engineering assignment in Tulsa in 1927, continuing in this work until 1941 when he was transferred to refinery construction as engineer. He was later promoted to assistant general superintendent, then became superintendent of construction on an aviation-fuel-plant project. In 1948 he was appointed general superintendent of construction and was made chief engineer, machinery section, general products sales department, August 1951.

Joining Jones & Laughlin Steel Corp. in 1935 at Memphis, Tenn., as sales engineer, Woods moved to Tulsa office as district sales manager in 1942. In 1944 he joined Jones & Laughlin Supply Co. as manager, J. & L. products sales. He graduated from Vanderbilt University where he majored in civil engineering.

Batchelor is a mechanical engineering graduate of Cornell University, Ithaca, N. Y., and before joining J. & L. in 1944 at Houston, had been an employe of Jones & Laughlin Steel since September 1926.

Prior to joining J. & L. in 1943 as a special representative in the tube sales department, Bergmann had been active in tube sales for other companies for several years.

Clarke joined J. & L. in 1936. In 1941 he entered military service, and reentered the company's service in 1945 as machinery sales engineer, and was promoted to assistant chief engineer, machinery section, general products in August 1951.

Howe has spent 38 years in oil-field supply work, starting as a storeman in 1914, with Atlas Supply Co. at Muskogee, Okla., later serving as sales manager until its purchase by J. & L. in 1944, when he joined J. & L. as assistant to sales manager. He became assistant to director of sales on January 1, 1952.

Shakely states that a review of Jones & Laughlin Supply Co.'s top sales personnel is not complete without the inclusion of H. H. Wilson, vice president, Houston; A. G. Bastian, sales manager, general products, and branch store operations, and his assistant, W. O. Hardy, both at Tulsa.

Oil Well Supply Promotes D. O. Smith

D. O. SMITH

Oil Well Supply Division of United States Steel Co. has appointed D. O. Smith assistant manager of its Gulf Coast area, as announced by Melvin F. Jones, area manager of sales and service. Gulf Coast headquarters are located in Houston.

Smith joined Oilwell in 1924 as a draftsman at its Imperial Works plant at Oil City, Pa. In June 1945 he was transferred to the company's home office in Dallas as supervisor of sales personnel and training. After 2 years in that position, he was named manager of the general sales department's product development and improvement section. In August 1949 he became manager of the Oklahoma district, and after 2 years was appointed assistant central midwest area manager at Midland, the position he held before his present appointment.

Sollberger Engineering Announces Name Change

Sollberger Engineering Co., Inc., Marshall, Tex., has announced the change of the company's name to Smith Steel Castings Co. Operations will continue as existed under Sollberger Engineering. Principals of Smith Steel are Gerald Smith and C. V. Smith.

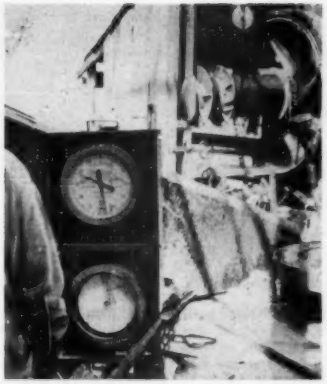
Blair Is Named Sales Manager for Whitmor

E. R. BLAIR

Appointment of E. R. Blair as sales and service manager for Whitmor Homebuilders, Inc., has been announced by Burl Johnson, vice president and general manager of the company. In his new duties Blair will supervise and direct Whitmor's increased volume of business.

Blair was formerly associated for 15 years with William Cameron Co. For the past year he was factory representative for Certainteed Products Corp.

W. F. Buaas, head of Buaas Drilling Corp., Bakersfield, Calif., was the first contractor to use a weight indicator. The weight indicator gage mounted on the girt above Buaas, was connected by copper tubing to the diaphragm-type pressure transformer to which he points.



This indicator and vernier, with recorder, was read in "points" instead of in thousands of pounds as is now the case. When the photo was taken in 1935, it was in use on a well being drilled in Montebello field near Los Angeles.

E. L. Decker, president of Martin-Decker Corp., looks over one of the firm's newest type drilling-control panels, appropriately called the "Silver Anniversary" model.

Martin-Decker Corp. Reaches 25-Year Milepost

TWENTY-FIVE years ago Martin-Decker Corp. entered business in a small shop in Long Beach, Calif., for the purpose of developing and manufacturing oil-well-drilling-control instruments. Such devices then were almost entirely unused—a driller gaged his rig's performance solely by feel and knowledge based on past experience. Today, paralleling the growth which has taken place in rotary-rig instrumentation, the company's plant occupies more than 20,000 sq. ft. of floor space, and about 90 per cent of the parts which go into Martin-Decker weight indicators and drilling-control instruments are produced there.

Loomis Oilwell Control Co. was the builder of the first piston-type wire-line deflector weight indicator, starting production in 1926. The Martin-Loomis Corp. was founded July 5, 1927, to take over the weight-indicator interests of the Loomis company. Control in Martin-Loomis was acquired by E. L. Decker and W. R. (Frosty) Martin in 1928 and the name of the company was changed to Martin-Decker Corp. in 1930. Martin retired in 1945 and is no longer associated with the firm. Decker, with the company also since its beginning, has guided its growth for the past 10 years.

The concern moved to its present location in 1930. Since then plant facilities have expanded six times, the last addition being made in 1950.

Modern rig instrumentation calls for a weight indicator and vernier, mud-pump pressure gage, drill-pipe torque gage, and rotary-table tachometer. There probably will be other instruments near the driller's post but these five are considered as essentials in guiding drilling operations.

A new Martin-Decker panel recently placed on the market includes the following instruments: A wire-line anchor and weight-indicator combination with vernier for use with 1⅜ and 1½-in. drilling lines, pump pressure gage, hydromechanical torque gage, rotary-table tachometer, a remote indicating electrical engine tachometer for each of the diesel engines, and a spring-mounted recorder for weight, mud pressure, and torque.

The panel also includes a Feedometer, a rate-of-penetration gage which shows directly the rate of feed in terms of feet per hour. In the case of one new panel, the Feedometer and controllers function with a National Supply Co. automatic feedoff mechanism built into the rig.

Still another feature is a draw-works speed selector, an indicator which shows the driller in what speed he should be operating the draw works during hoisting operations. The speed selector connected into the weight-indicator system has a dial face calibrated to draw-works design data furnished by the draw-works manufacturer. Once calibrated to the rig's hoisting capabilities, the device is of material assistance in eliminating chain, clutch, and gear overloading.

First weight-indicator gages were mounted on the first girt of the derrick, several feet distant from the driller's post. Copper tubing was used to connect the instrument to the pressure transformer mounted on the dead line. The tubing had to be disconnected each time the rig was moved, and then reconnected, purged, and rezeroed before being again used.

By 1930 necessity for greater accuracy resulted in the addition of a vernier to the indicator, a gage six times more sensitive than the standard. About this time the value of having the mud-pressure gage installed where the driller could view it from his post also was recognized. In the early '30's need for two additional instruments — a torque gage and rotary-table tachometer—led to the housing of all five in a "Quintiplex" panel placed near the driller's post.

In 1936 the first sealed system was introduced, eliminating copper tubing and the inconveniences encountered with its use. Also about this time the weight-indicator gages were changed so that they gave a direct reading in thousands of pounds. Until then the gage dials were calibrated to read from zero to 100; drillers had coined the term "points" as a measure of the amount of weight being carried. To obtain the weight being carried on the hook in thousands of pounds, it was necessary to take into consideration the size of the drilling line and number of lines used and then refer to prepared tables.

Recorders which would give a permanent record of weight, pump pressures, and torque also had been introduced. In more recent years as drill-pipe feedoff controls came into use, provisions for incorporating these instruments in

the drilling-control panel were added.

A recent important development occurred in 1947 when in conjunction with National Supply Co. the anchor-type weight indicator was placed on the market. The Ideal wire-line anchor functions as a dead-line anchoring means, and as the device for converting deadline pull into a readable hydraulic pressure. This unit in connection with the newly designed weight indicator shows both total weight and net weight being carried on the bit. Weights are shown directly in thousands of pounds.

While the concern in its early days had a very difficult time getting the drilling industry to accept the weight indicator and drilling controls, these instruments now are used on rigs all over the world. Reed Roller Bit Co. has been distributor for Martin-Decker products in the Mid-Continent and Gulf Coast almost from the company's beginning. Reed also distributes Martin-Decker products in western Canada.

Martin-Decker is the distributor for National's types D, E, and F wire-line anchors. All Martin-Decker weight indicators are sold through National and National Supply Export Corp. and other suppliers in the United States.

Advertising Subject of Salesmen August Meeting

The role of industrial advertising in helping the equipment salesman was discussed by H. E. Cassidy, vice president of The McCarthy Co., industrial advertising agency, at the August meeting of Petroleum Equipment Salesmen's Association, Los Angeles.

Cassidy stressed the great usefulness of advertising in paving the way for salesmen. He also laid emphasis on the salesman's responsibility and opportunity to make industrial advertising more effective, and pointed out that cooperation from salesmen is a vital factor in making advertising fully effective.

D. H. Greenwood, Falcon Products, Inc., president of the association, presided.

Personnel Changes Named By Continental Supply

Recent personnel changes have been announced by The Continental Supply Co.

J. A. McCreery has been named manager of the Elk City, Okla., store. He was formerly field salesman at the same location.

E. D. Lawrence has been transferred to the New Orleans district office where he will serve as sales representative. Prior to this new appointment, Lawrence was field salesman at Lake Charles.

Sidney G. Pierce, formerly floorman at Alice, Tex., has been named new manager of the McAllen, Tex., store.

W. C. Norris Holds Annual Sales Meeting

W. C. Norris personnel in attendance at recent annual sales meeting were, seated: M. L. Parker, Odessa, Tex.; J. W. Whitaker, Fort Worth; J. E. Giles and Arthur Miller, Jr., Tulsa; Jack Getty, Shreveport; A. C. Cloud, Odessa; G. W. Davidson, Tulsa; LeRoy Mitchell, Casper, Wyo.; and K. M. Cook, Abilene, Tex. Standing: Jack Schaff, Wichita Falls, Tex.; D. P. Hagaman, Salem, Ill.; A. L. Ethridge, Oklahoma City; Clyde C. Sights, Evansville, Ind.; J. W. Bowen, Houston; C. L. Snelling, Ricard Ohrstrom, and A. A. Hardy, Tulsa; Cecil Fair, Great Bend, Kans.; D. W. Stewart, Midland, Tex.; W. C. Tolleson, Kilgore, Tex., and C. B. Schofield, Tulsa.

W. C. Norris Manufacturer, Inc. annual sales meeting was held in early June at its home offices and plant in Tulsa. G. W. Davidson, general sales manager, conducted round-table sessions, assisted by Arthur Miller, Jr., assistant sales manager. A. A. Hardy, chief engineer, led a discussion of technical phases of new products.

All field men visited the plant and studied improved manufacturing processes, inspection, and shipping.

Norman K. Rector Joins Walco Engineering Staff

N. K. RECTOR

Norman K. Rector has joined the staff of Walco Engineering & Construction Co., it has been announced by Paul G. Wallack, president. Rector fills the position of chief design and process engineer with the Tulsa firm. From 1950 until joining Walco, Rector worked as an independent consulting engineer in the natural-gasoline-plant field. His earlier experience included work with Petroleum Engineering, Inc., in Tulsa and Houston, and the Gregg-Tex Gasoline Corp., Longview, Tex.

Rector started in the petroleum field with Marland Oil Co. at Ponca City, Okla., in 1926.

Rector has been responsible for the fundamental design of some 50 complete gasoline plants and refinery vapor-recovery units, and more than 60 major plant extensions involving complete process design.

Blackmer Names Lanthorn General Sales Manager

E. H. LANTHORN

Elmer H. Lanthorn has been appointed general sales manager of Blackmer Pump Co., according to Brittin L. Gordon, president.

Lanthorn has been associated with Peerless Pump Division of Food Machinery & Chemical Corp. since 1946 in engineering and sales management functions. He is a graduate of West Virginia Institute of Technology, and is recognized as an authority on pumps.

Larkin Appoints Kline Western Representative

Appointment of Al K. Kline as western representative of Larkin & Co., Inc., Butler, Pa., has been announced by M. E. Mitchell, president.

Kline has formerly been associated with Calco Oil Tools, Tulsa, and Baker Oil Tools, in Oklahoma, Texas, and Illinois.

In his new position Kline will be in charge of Larkin's new office and warehouse facilities in Tulsa, and will direct sales of packers designed for primary, secondary, and tertiary oil recovery in Mid-Continent areas.

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EQUIPMENT FOR SALE

FOR SALE: One 36-L Bucyrus-Erie drilling machine, complete with tools. Also 1,942 ft., new 7 inch, 17 lb., H-40, range 2, seamless casing and 2,400 ft. of new 2⅜ inch, 4.90 lb., range 2, J-55, seamless regular tubing. Box E-812, The Oil and Gas Journal, Tulsa, Oklahoma.

CATERPILLAR DIESEL GENERATOR
25 KW, 3 phase, 220-440 volts. Excellent auxiliary lighting and power unit. Otis Coles, Jr., P. O. Box 126, El Paso, Texas.

FOR SALE: 1500 ft. new 11# line pipe, 1540 ft. used seamless. All 4½ and range two. C. H. Reser, Hamilton, Kansas. Ph. 2791.

FOR SALE: 4000' 5½" seamless casing, range one 11½ thread, and 5000' 2" seamless tubing, range one, 11½ thread. M. J. Regan Pipe Co., Coffeyville, Kans.

FOR SALE: Cardwell Model "R" Drilling outfit consisting of double drum draw works, powered D-13000, skid mounted 7¼ Oilwell pump, powered D-17000 mast is ninety foot bender, subbases, 10 KW light plant, Linkbelt shaker, steel dog house, traveling blocks, swivel, tongs and rotary table. Write for complete inventory—The Ralph M. Parsons Company 617 South Olive Street, Los Angeles 14, California.

FOR SALE: One 4'0" ID x 40'6" x 11/16" shell Tower. Hastalloy lined, no trays. 250# WP for vertical erection. Price $1,500.00. Kinslow Power & Equipment Co., 617 So. Boulder, Tulsa 14, Okla.

FOR SALE
RECONDITIONED ROTARY EQUIPMENT

1—Wilson Giant Double Drum Single Engine Drawworks with Catheads, Drilling Line, powered with 225 H.P. Waukesha.

2—Unitized 6" x 16" Wilson-Snyder Power Pump, 3 runner Skids, V-Belt Drive and Guard, powered by RXIV LeRoi V-8 Engine.

1—Cardwell Model K Single Drum Rotary Drawworks Unitized on Lowboy Trailer with telescoping poles, powered by SRKU Waukesha.

1—Unitized and Lowboy Trailer mounted —6 x 12 Wilson-Snyder Power Pump with V-Belt Drive and Guard powered by 145 GKU Waukesha.

1—#OB-12-L Brewster Rotary.

8000 Feet—3½" OD Drill Pipe—Good condition.

Above is only a partial list of Reconditioned Rotary Equipment available.

EMPIRE MACHINERY CO.
Box 4028—Phone 6-9181
Odessa, Texas
Box 1978—Phone 4-8196
Abilene, Texas

EQUIPMENT FOR SALE

PIPE
All sizes; line pipe and casing, tanks, and Oilfield supplies. Edco Pipe & Supply Co., Phone 45970, P.O. Box 151, Tulsa, Oklahoma

FOR SALE: 1—25 AH Dodge Drilling Clutch Powered 145 GK Waukesha Engine. Good Condition. (Used). 1—50 AH Dodge Drilling Clutch Powered JL-1335 Buda Engine. Fine Condition (Used). 1—Young Drilling Unit Powered R6I Climax Engine in Good Condition. (Used). 1—2-720 Gal. Butane tank on skids, also a quantity Used Cable Drilling Tools of all kinds in Good Condition. Midway Tool Company, Box 248, Mt. Pleasant, Michigan.

FOR SALE: 186 miles of 6⅝" O.D. x 18.97 lbs. Line Pipe. Single Random Length, Plain Ends beveled for welding and primed, now being taken up in Indiana and Illinois where line was operated under 850 lbs. working pressure. Material available for inspection. For further information please write or call: Commercial Metals Company, P. O. Box 1046, Dallas, Texas, HUnter 4651; Standard Pipe Supply Company, P. O. Box 243, Houston, Texas, CHarter 6976; Texas Pipe Supply Company, P. O. Box 1231, Houston, Texas, BLackstone 0101; Davidson Pipe Company, Inc., 2nd Avenue 50th-51st Streets, Brooklyn 32, New York, GEdney 9-6300.

Gaso Duplex 4½" x 6" Power Pumps with Chrysler C-36 Engines, skid mounted, immediate delivery. Also Byron Jackson, Carter Centrifugal Units. Westinghouse 20-25-50 KW Generating Units.

H. H. COFFIELD
Attn.: W. H. ORR
Phones: 132—Rockdale, Texas
AT-3427—Houston, Texas

FOR SALE

1—Bessemer type ten with 17" overhead power cylinders. Compressor cylinders to suit purchaser.

1—Clark twin gas engine driven compressor with overhead power cylinders and compressor cylinder to suit purchaser.

1—Bessemer type ten single 80 hp. 16" overhead exhaust. Above machines completely rebuilt.

W. S. SMITH
Tulsa 2-5471 — 285 Thompson Bldg.
Tulsa, Okla.

EQUIPMENT FOR SALE

1 MODEL "K" Cardwell Double Drum Spudder. 145 GK Waukesha Motor. Skid mounted. ¾" Drilling 9/16" Sand Lines. These lines are 4000'. Tools for 7" and 5½" Hole. Hand Tools Tubing & Rod Tools Complete. Butane Tank, Steel Dog House. This Rig has Folding floor and Roof. Gaines Drilling Co., Box 547, El Dorado, Kansas. Phone 2317.

FOR SALE: 1-43C Heavy Duty Star Spudder A-1 Condition, complete with 10" to 5" Tools, Diesel Power and all necessary equipment to drill wells. Contact A. H. Alcock, Box 146, Office phone #301, Res. phone 2270, Chanute, Kansas.

EQUIPMENT For Sale: 2—32 hp. pumping units. 1 Nat'l, skid mounted. 1 Emsco on cement. 1—Tank battery B S & B. 1—10x24 wooden gun bbl. 2—250 bbl. bolted steel tanks. 1—New 10x16 210 bbl. wooden gun obl. ready to move. 1—5500G Caterpillar gas or gasoline engine w/ 2 V belt pulleys—outboard bearing. Harper Well Servicing, Box C, Burrton, Kansas

PRESSURE VESSELS
Immediately Available

8—10' ID dia. x 40' x 3" shell. Heads 3½". Test Pressure 900 psi. WP 600 psi.

5—10' ID dia. x 40' x 2½" shell. Heads 3". Test Pressure 750 psi. WP 500 psi.

8—9' ID dia. x 40' x 3" shell. Heads 2¼". Test Pressure 750 psi. WP 500 psi.

1—9' ID dia. x 40' x 3" shell. Heads 2¼". Test Pressure 750 psi. WP 500 psi.

All used, good condition, seam to seam, welded code construction. Built by A. O. Smith Corp. Located near Chicago, Ill. Prints, prices available on request.

WIRE—PHONE—WRITE

KINSLOW POWER & EQUIPMENT CO.
617 So. Boulder, Tulsa, Okla.
Phone 5-5514

USED NATIONAL MODEL-50 ROTARY RIG READY TO DRILL COMPLETE WITH

Lee C. Moore 97' Mast, two JL1335 Buda Engines in excellent running condition, C-150 Slush Pump, 3750' Drill Pipe, and all tools and equipment necessary for immediate operations.

LIBERAL TERMS IF DESIRED TO RATED PARTIES

Call—Wire—Write

MOUNTAIN IRON & SUPPLY COMPANY
714 Fourth National Bank Building, Wichita, Kansas — Phone 7-4238

EQUIPMENT FOR SALE

FOR SALE: Fort Worth Spudder mounted on tandem with new UD9 International motor and complete equipment for shallow drilling including GMC 46 model 3-ton truck with float, GMC 39 model 1¾-ton truck, GMC 49 model ¾-ton pickup, Wilson 200 amp. portable welding machine, complete utility unit, 4,300 ft. ⅝-in. drill line, 800 ft. 8-in. pipe. Chas. C. Reid, 1720 Keeler St., Wichita Falls, Texas, phone 6495 or 8001.

OIL RIG for Sale: 45 Star spudder A-1 condition complete with tools, workshop and 3,000 foot sand line. Also will sell string of 7" and 8" casing with Rig. Contact B. N. Cardwell, Middlesboro, Kentucky.

TANK BATTERY: Two 200 barrel welded steel B S & B tanks steel walkaway and stairway, all connections. One 6' by 20' National oil treater. One 5' by 15' B S & B separator with pipe stand. One 123' angle iron derrick. S. & S. Pipe & Supply Company, Box 2513, Phone 50-9287, Tulsa, Oklahoma.

FOR IMPORT: Am. Stand. Black & Galv. Pipe, T&C API Line Pipe, OH MS Plates, ⅜" to 1". Domestic: All sizes, specifications, grades Used Pipe and Tubing. Weil-Robbins, Inc., 117 Liberty Str., New York 6, N. Y.

ENGINES

3 Waukesha Hesselman Model 6LRHU, 240 BHP at 900 rpm. Brand new. Complete with all accessories, radiator to flywheel, gasoline engine starting. **Convertible for gas operation and electric starting.** $20,000.00 for the lot, f.o.b. New York. Available for inspection.

Box 29, Long Island City 1, New York

PIPE IMMEDIATE DELIVERY

Subject to Prior Sales

Clean, Straightened & Beveled, Double Jointed or With Couplings.

OPS Ceiling Prices FOB Mexico and St. Charles, Mo.

APPROXIMATELY 350 miles—8⅝" OD Line Pipe—28.55#, .322 Wall.

APPROXIMATELY 30 miles—12¾" OD Line Pipe—50#, .375 Wall.

Phone, Write, Wire

CONSTRUCTORS' MATERIAL & EQUIPMENT COMPANY

General Delivery, Phone 95, Mexico, Mo. Box 5216, Phone 8-3378, Tulsa, Okla.

FOR SALE—AIRCRAFT

RUGGED RELIABLE PBY5A CATALINA

TWENTY ONE HOUR CRUISING RANGE AT 150 M.P.H.

Privately owned P.B.Y. major overhauled and converted to consolidated aircraft Model ACF-25. Licensed April 1952 Passenger-Cargo. Clipper bow, modified tail, cargo floors and doors, one compartment plushed with 8 seats, 2 tables. Firewall shut off valves, electric circuit breaker system, electric cowl flaps, engineers turret removed. All controls in pilot compartment. 1830-92 engines, airline type radio. DUAL ADF etc. 110 hours on airframe and engines since major. 2400 total airframe. Painted light gray and red. No corrosion. Ready to fly. Will trade for smaller ship or drilling equipment.

DUNLAP & GRAHAM, INC.

Drilling Contractors
2450 Cerritos Avenue
Long Beach 6, California

EQUIPMENT FOR SALE

SALES and rentals of cable drilling and fishing tools, casing and equipment, from the Southwest's largest stock of used cable tools and oil field supplies. Degen Pipe and Supply Co., Tulsa, Oklahoma.

EXECUTIVE B-25 For Sale: Converted by AiResearch Aviation in 1949. Very plush interior. Seats 8 passengers comfortably. Formica type interior. Total airplane time, 1300:00; left engine total, 102:00; right engine total, 480:00. New props, new tires, 1000-lb. baggage compartment in nose. 200,000 Janitrol heater. High pressure oxygen system. Ice box, liquid thermos, toilet, cabin radio, two speakers. 200 MPH cruise, 1800-mile range. Airline type fire warning. Aeroquip hose, collector rings. Radio: ARC Omni, ILS, Dual ADF, Marker beacon, Low frequency transmitter and receiver, ARC Isolation amplifier, ARC-VHF transmitter and receiver. Ship very clean inside and out, A-1 condition. Continental Oil Company, Aviation Section, Ponca City, Oklahoma. Telephone LD-7, Extension 650 or 322.

BUCYRUS-ERIE 36-L, New 1950, Cummins diesel engine, complete string tools 5 to 8", New 3500 ft. wire line. Used very little and like new in every respect. $22,500. Oil Producers, Inc., Murray Bldg., Grand Rapids, Michigan.

MACHINE shop equipment, 2 lathes, 1 milling machine, 1 shaper, 1 drill press, 1 bolt threader. Machines driven through line shafts with 1½ hp. and 7½ hp. electric motors. Keyes Drilling Co., Box 1106, Roswell, N. M.

FILTERS for Oil Clarification

22—Sperry 18" x 18" Filter Presses, plate and frame, closed delivery, 11 chambers, 1½".

CONSOLIDATED PRODUCTS CO., INC.
17-20 Park Row New York 38, N. Y.
BArclay 7-0600

DRILLING EQUIPMENT

1—Fred Cooper Double Drum Well Servicing Unit with Spudding Attachment. Equipped for Butane.

1—Steel Dog House mounted on new John Deere 4 wheel Trailer.

1—4 Wheel Trailer Heavy Duty (New) for hauling tools & flooring.

Complete unit Tools, Swabs and other equipment.

3500' of ⅞" Drilling and ⅝" Sand Lines for Cleaning out and Work over jobs.

GAINES DRILLING COMPANY
P. O. Box 547
El Dorado, Kansas

FOR SALE
USED REFINERY EQUIPMENT

ONE (1)—Vacuum Flash Tower; Top section contains 5 trays on 27" spacing. I.D. is 9 feet. Bottom section contains 5 trays on 27" spacing. I.D. is 6 ft. (11)—18" Manways on ½" thick shell.

ONE (1)—3'6" O.D. Fractionating Tower containing 5 trays on 24" spacing. Design Pressure 25 P.S.I.G.

ONE (1)—3' x 17' Sulphur Tank; ⅜" Shell and Dished Heads.

ONE (1)—4' x 12' Distillate Receiver Tank; ⅜" shell and ½" Dished Heads.

ONE (1)—Water Tower welded; 100,000 gallon capacity mounted on 70' steel supports.

ONE (1)—150,000 gallon storage tank. Welded 16' high x 40' diameter.

TWO (2)—Pressure Tanks—80# 10' x 44' —25000 gallon capacity each. ⅝" shell, ¾" heads.

25,000 square feet of condenser and exchanger surface in various sizes. Expansion Joints; Ring type, 8" to 24". Valves; Electric Motor Driven.

Many other miscellaneous items such as pumps, valves, flanges, tube return bends, stacks, etc.

Located in Michigan. For further information write or contact Box E-920, The Oil and Gas Journal, Tulsa, Okla.

EQUIPMENT FOR SALE

10,000' 4½" API Full Hole Drill Pipe tested by Sonoscope engineers, also 1075 6⅝" OD 36# Drill Pipe, like new. Milford Giffin, Tel. 477, Hoisington, Kansas.

ROTARY RIG Complete—For Sale: Bethlehem Breeze S-45 with Twin GMC's Torque converted drawworks with 96 foot Lee C. Moore mast. 7½" x 14" Bethlehem Pump with twin six GMC's. Includes Dog house, fuel tank, water tank, mud boats, and 3,400 feet of Drill Pipe. We desire to sell this rig because it is too small for West Texas operations. We will guarantee this rig to be in A-1 condition and ready to work. It is practically brand new. This rig is in our yard at Salem, Illinois. Herman Graham Drilling Company, Box 176, Salem, Illinois.

1951 INTERNATIONAL TD18A For Sale: 74" tread crawler tractor. Equipped with Ateco inside Bulldozer with heavy winch and winch guard. This tractor has only 340 hours service. We have moved our operations from Illinois to West Texas. This tractor is located in our yard at Salem, Illinois. Herman Graham Drilling Co., Box 176, Salem, Illinois.

FOR SALE: Fort Worth Super "J" Spudder with large assortment heavy cable tools and wire lines, also engine, propane tank and other miscellaneous equipment. A heavy duty rig for drilling in the Rocky Mountain Area. $15,000.00. Located at Chromo, Colorado, in the San Juan Basin. Subject to prior sale. Contact H. Blume Johnson, Butler-Johnson Service Corp., Shreveport, La., or W. J. Osterhoudt, Box 175, Durango, Colo.

I HAVE 1850' of 32#, 8" lap-weld secondhand casing; will trade for 4½" OD, 5½" OD or 7" OD casing. Call Francis Loriaux, Phone 21, Lost Springs, Kansas.

FOR SALE: One model R Cardwell double drum hoist Serial No. RLGMD-687 powered by Model GK-145 Waukesha engine. New, never been used. Factory list price plus trucking and insurance. Fox Well Servicing Co., Box 488, Healdton, Okla. Phone 605.

FOR SALE: Wilson Giant Draw Works complete with catheads, pump drive, 2—JL-1335 Buda Engines compounded, all ready to drill, $7500. Also 4500' 4½" good used DRILL PIPE. In Contractor's yard near Hays, Kansas. Phone 5-4172, or write 306 Derby Bldg., Wichita, Kansas.

WELL drilling equipment, new or used. Spudders, rotaries, core & shot hole drills, tools, pipe, bits, blocks, pump jacks, valves. Everything for well drilling and service. Fishing tools rented. Pressey & Son, Pueblo, Colo.

WANT EQUIPMENT: Did you find the equipment you wish to purchase in this column? If not, use an "Equipment Wanted" classified advertisement to find it. It is available somewhere and Journal classified advertisements will find it. See box heading for classified rates, or write The Oil and Gas Journal.

EQUIPMENT WANTED

WANTED: 12" OD, new or used couplings. Advise thread, length, condition and price. Can use several hundred if they are good. Atlas Pipe, Inc., of Corpus Christi, P. O. Box 2368, Corpus Christi, Texas.

WILL PAY highest prices for used casing, used line pipe, abandoned leases, or other surplus lease equipment. Your idle producing equipment is worth dollars. Green Pipe & Supply Co., Box 1383, Tulsa, Oklahoma.

WE BUY well drilling equipment machines, cable tools, pipe, etc. Turn your surplus equipment into cash. Pressey & Son, Pueblo, Colorado.

WANTED: Three engine compound for Wilson Titan drawworks. Makin Drilling Company, Box 1628, Phone 3-3141, Hobbs, New Mexico.

WANTED: Rotary to drill 1000', Oklahoma lease. Will give interest or if dry hole will pay for use. Box 216, Cut Bank, Montana.

EQUIPMENT NOT IN USE: Did you find a buyer in this column for the equipment you have for sale? Someone wants it and an "Equipment For Sale" classified advertisement in the Journal will find a buyer. See box heading for classified rates or write The Oil and Gas Journal.

HELP WANTED

CHEMIST EXPERIENCED in PETROLEUM PROCESSING or PETROLEUM RESEARCH, under 40 years of age for small research and development group. Box E-908, The Oil and Gas Journal, Tulsa, Oklahoma.

WANTED: Experienced Refinery Mechanical Engineer for job in middle sized refinery located in Middle Western State. Please state age, experience, and educational qualifications. Box E-906, The Oil and Gas Journal, Tulsa, Oklahoma.

WANTED: Experienced Refinery Processing Engineer for job in middle sized refinery located in Middle Western State. Please state age, experience, and educational qualifications. Box E-905, The Oil and Gas Journal, Tulsa, Oklahoma.

EXPERIENCED PETROLEUM ENGINEER under 40 years of age for small research and development group. Box E-907, The Oil and Gas Journal, Tulsa, Oklahoma .

WANTED: Experienced seismic party chiefs, observers and computors for service in Central and South American countries. Must be prepared to fulfill two year contracts at appropriate salary. Assignments starting not later than December 1952. Write giving details of experience and education. Letters will be held confidential. Box E-928, The Oil and Gas Journal, Tulsa, Oklahoma.

REFINERY EXECUTIVE

Independent integrated petroleum company has opening for manager of moderate size complete refinery. Experience with modern processing, labor relations, cost control, as well as organizing ability essential. Salary open. Prospects for the future are exceptionally good for a qualified man. All replies confidential. Box 930, The Oil and Gas Journal, Tulsa, Oklahoma.

MECHANICAL ENGINEER

An old, established Los Angeles manufacturer of Oil Well Tools is expanding production on a newly developed, much-needed drilling specialty and wants a Graduate Mechanical Engineer with rig and shop experience as Plant Superintendent in charge of manufacture and field delivery. He will work directly under top management. He must be able to handle men and to supervise purchasing as well as production. Age limit—35 to 45.

This is an exceptional opportunity for a young, progressive, practical engineering executive who is looking for an excellent, permanent and profitable connection in Southern California. Salary and bonus limited only by the man's ability. Write us in detail. All correspondence strictly confidential.

Box E-927, The Oil and Gas Journal, Tulsa, Oklahoma

HELP WANTED

OIL Industry Employment Service, 405 Tuloma Bldg., Tulsa, Okla. 4-5974, Tom Robinson, owner. For technical and trained personnel. Optional with applicant whether he or employer pays our fee.

WANTED—SEISMOGRAPH PARTY CHIEF. Must be fully qualified. Age 27-38. A good opportunity for the right man. Box E-770, The Oil and Gas Journal, Tulsa, Oklahoma.

ASSISTANT SALES MANAGER for oil country tubular goods with a national manufacturer in territory western half of U. S. Position requires 10 to 15 years' sales experience in similar position or representing oil field supply house, Mid-Continent area preferred. Age 35 to 45. Salary open. Write, giving details of experience and training to Box E-902, The Oil and Gas Journal, Tulsa, Oklahoma.

PETROLEUM ENGINEERS, GEOLOGISTS, DRAFTSMEN, with field experience for Rocky Mtn. positions. Good future with both Majors and Independents. Write Professional Placement Service, 516 University Bldg., Denver, Colorado.

ENGINEER, CHEMICAL. Excellent opportunity with small, well established engineering company. Wide scope of independent work on process, design, operations, economies, patents, etc. Attractive location and working conditions. Some travel. Box E-929, The Oil and Gas Journal, Tulsa, Oklahoma.

ENGINEER REQUIRED

Graduate Engineer, fully experienced in Oil Refinery Engineering, to handle senior engineering detail of a modernization and expansion project for an Independent Refinery in Western Canada. Permanent position in senior capacity following completion of project. Please give full information, including age, education, experience and salary expected in first letter.

Box E-925

THE OIL AND GAS JOURNAL
Tulsa, Oklahoma

GEOLOGIST

For subsurface work in Saudi Arabia. Degree plus 5 years' experience in well-sitting, and with some knowledge of micro-paleontology. Salary open.

Write giving personal history and work experience. Please include telephone number.

Box E-924

THE OIL AND GAS JOURNAL
Tulsa, Oklahoma

HELP WANTED

WANTED: Refinery instrument repair man. Must be qualified to repair and maintain all types of refinery instrumentation. State age, qualifications and desired salary when applying. Box E-867, The Oil and Gas Journal, Tulsa, Oklahoma.

GRAVITY Party Chief, operators and surveyors with experience in South America. Top salary for the right men. Present personnel advised of this ad. Box E-943, The Oil and Gas Journal, Tulsa, Oklahoma.

MAN experienced in accounting methods in refining industry. Must have ability to set up and be in charge of accepted methods and procedures used in refining industry and be qualified to supervise office personnel. Box E-886, The Oil and Gas Journal, Tulsa, Oklahoma.

THE POSITION YOU WANT: Oil industry companies are looking for men to fill every conceivable kind of position. If you didn't find the position in this column that you are looking for, use a "Situation Wanted" classified advertisement to state your qualifications. Some company is probably looking for your ability. See box heading for classified rates or write The Oil and Gas Journal.

SALES REPRESENTATIVE WANTED

Established Plastic Pipe manufacturer wants high grade man of experience as general sales representative in Mid-Continent field. Write giving full information including salary requirement in first letter.

Box E-933

The Oil and Gas Journal
Tulsa, Oklahoma

GEOPHYSICAL OPPORTUNITIES

Excellent opportunity with established and expanding geophysical company operating throughout the United States—

Experienced
Shot Hole Drillers

Asst. Shot Hole Drillers

Surveyors

Observers

Seismic Party Chiefs

Computers

College graduates in
Physics, Engineering or Geology
for Computer Trainees

All applicants must submit references and qualifications.

Write or Phone

SOUTHERN GEOPHYSICAL COMPANY
Phone Edison-1234
600 Bailey Avenue—P.O. Box 2142
FORT WORTH, TEXAS

FIELD SALES ENGINEER

The Job: To give on-the-job instruction and supervision to construction crews, foremen and superintendents in the best methods of installing pipe couplings, repair clamps and sleeves so as to insure proper installation. To make field studies and reports of such installations, developing therefrom new uses for present products and ideas for new products. To maintain contacts with technical personnel in the gas, water, and sewage markets. To cooperate with the Company's Engineering Department in improving installation procedures and product development.

The Man: Should be a college graduate with degree in mechanical engineering, between the ages of 25 and 35. Some field engineering experience in gas or waterworks pipe line construction preferable. Must have type of personality that will secure the liking, and command the respect of field crews, construction foremen, superintendents, etc. Must be willing to spend 75% of his time in the field.

The Company: The leading manufacturer of pipe couplings and pipe repairing devices. Future growth of gas and water lines business requires full time services of field engineers. Send complete resume of background and salary requirements to Personnel Manager.

DRESSER MANUFACTURING DIVISION
Bradford, Pennsylvania
One of the Dresser Industries

HELP WANTED

SEISMIC PERSONNEL needed for United States and Canada by well known and expanding contract geophysical company. Address Box E-863, The Oil and Gas Journal, Tulsa, Oklahoma.

ENGINEERS, Executives, Technical Men. Salaried positions—$3600 to $30,000. This confidential service for outstanding men who desire a change of connection. Will develop and conduct preliminary negotiations without risk to present position. Send name and address for details. Tomsett Associates, 434 Frick Bldg., Pittsburgh 19, Pa.

SITUATIONS WANTED

EXPERIENCED OIL AND GAS EXECUTIVE, age 39, Petroleum Engineer, University Oklahoma. Broad experience in petroleum engineering, sales, government, construction, gas utilities. Desire change to progressive oil and gas company. Presently employed, Senior Engineer, Gas Transmission Company. Preferable location Houston. Box E-903, The Oil and Gas Journal, Tulsa, Oklahoma.

PRODUCTION SUPERINTENDENT. Graduate Petroleum Engineer. 12 years responsible experience producing industry. Geological ability. Mid-Continent or Rocky Mountains. Box E-774, The Oil and Gas Journal, Tulsa, Oklahoma.

LANDMAN: Over twenty years in industry with Major company, desires connection with Independent. Age 49. Available. References. Box E-935, The Oil and Gas Journal, Tulsa, Oklahoma.

ACCOUNTING Major Desires Change. 3½ years experience, payroll, audits, income tax, reconciliation statements, paying bills, etc. Prefer Midwestern or Rocky Mountain. Box E-931, The Oil and Gas Journal, Tulsa, Oklahoma.

GRADUATE Geologist and Engineer, age 30, five years varied experience major California oil company. Subsurface and petroleum engineering, production. Now district petroleum engineer. Desire to locate Denver. All type offers considered. Box E-932, The Oil and Gas Journal, Tulsa, Oklahoma.

PROCESS Engineer or Supervisor—Chemical Engineer, five years refining experience, including fluid catalytic cracking operation and supervision. Looking for responsible position with small refiner. Box E-889, The Oil and Gas Journal, Tulsa, Oklahoma.

ATTENTION: Well established oil well drilling contractor desires to manage and supervise: Individuals', groups', small or medium-sized oil companies' drilling, production and operating problems in Central and Western Texas, and New Mexico. Personal interview by appointment is desired. Makin Drilling Company, Box No. 1628. Ph. No. 3-3141, Hobbs, New Mexico.

THE RIGHT MAN: Can you fill the position you have open from the qualifications listed in this column? Men are always looking for an opportunity to improve themselves. Use a "Help Wanted" Journal classified advertisement to find the men you need. See box heading for classified rates or write The Oil and Gas Journal.

LEASE AND DRILLING BLOCKS

AM interested in acquiring old or nearly depleted oil properties in Southern Oklahoma and North Texas areas. Give details. R. H. Niccolls, Box 2401, Dallas, Texas.

FOR LEASE: The owners of the land and/or the mineral rights on 75,000 acres in Northeastern Louisiana would like to secure proposals for exploration and development on large or small acreages. One producer on the tract. Box E-864, The Oil and Gas Journal, Tulsa, Oklahoma.

WILL pay cash instantly for leases (large blocks), royalties, mineral deeds, production. Write fully—P. O. Box 2153, Denver, Colorado.

LEASES ROYALTIES

Producing and Nonproducing

Bought and Sold—Any Area

Inquiries Invited

B. D. BUCKLEY

6635 Delmar Ave., St. Louis 5, Mo.

LEASE AND DRILLING BLOCKS

FOR SALE: 160 to 20,000 Acres State Oil Leases in Roosevelt, Quay, Hidalgo, Otero and Socorro Counties in New Mexico. Frank Sunseri, 1366 S. Mansfield Ave., Los Angeles, Calif.

BLOCKS in Eastern Kansas. Highly recommended by geologists, also 960 acres shallow production, some undrilled locations. Box 733 Topeka, Kansas.

FOR SALE: 13,000 acres Wild Cat new 10 year leases, in SE New Mexico. Box E-865, The Oil and Gas Journal, Tulsa, Oklahoma.

WANTED to buy a stripper lease. Box E-917, The Oil and Gas Journal, Tulsa, Oklahoma.

WILL give 112 acre lease for 90 day drilling contract, 1 year lease, 5000' test. One time good producer, location Young County, Texas, Mary E. Criswell Survey, Abstract #1772, known as the J. W. Burnett sub-division Section 2, Block C. Reserve right to withdraw offer any time. Inquire Box 722, Clifton, Arizona.

LOOKING FOR A LEASE? There will be over 40,000 wells drilled this year. If you are looking for a lease, drilling block, or drilling deal and haven't found it in this column, or if you have a lease or drilling block you want drilled, a Journal classified advertisement can find an interested party. See box heading for classified rates, or write The Oil and Gas Journal.

BUSINESS OPPORTUNITIES

ARMAND TEDESCHI, Geophysical Surveys, Calif. only, Gas & Oil structures, Calistoga, Calif. Services guaranteed.

EXPERIENCED, established Geologist has farm outs, drilling deals, royalties and minerals in West Texas. Box E-913, The Oil and Gas Journal, Tulsa, Oklahoma.

DEALERS, Investors, Lease, Mineral Investments large or small, 5 to 100 for one being made. Stands Investigation. References. E. M. Adams, Marshall, Texas.

INDEPENDENT PRODUCER

has surface pipe, casing and tubing and wants good deal. Would trade pipe for interest in good well or will take farm out on proven or offset acreage, not over 9000'. Limited to Texas only.

Box E-892

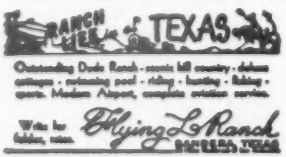
THE OIL AND GAS JOURNAL

Tulsa, Oklahoma

CAPITAL AVAILABLE

IMMEDIATE Capital Available for laying pipe lines and gathering systems in Texas. We are also interested in purchasing actively operating pipe lines and gathering systems. Box E-934, The Oil and Gas Journal, Tulsa, Oklahoma.

RESORTS


RANCH
TEXAS
Outstanding Dude Ranch - scenic hill country - deluxe cottages - swimming pool - riding - hunting - fishing - sports. Modern Airport, complete aviation service.
Write for folder, rates.
Flying L Ranch
BOERNE, TEXAS

ROYALTIES

280 ACRES Leases, 50 acres land owner's royalty. Originally 1000 bbl. oil wells, 12 M. gas vicinity. Pipe line, 38 gravity oil. ½ interest lease, royalty, well drilled through Dutcher sand, $4500.00 cash. L. Price, Coweta, Okla.

1,000,000 ACRES PLUS: Attractive geologic structure: Best wildcat have been on past 35 years. Engineers say "Sure shot production 4000' to 6500'." Box 321, Richland, Oregon.

WILLISTON BASIN ROYALTIES

Dealers in Montana royalties since 1921, we now specialize in royalties under major company leases in the Montana portion of the Williston Basin. For information on our method of operation, write LANDOWNERS ROYALTIES COMPANY, Box 1225, Great Falls, Montana.

JACK EAGLE—Pay you immediately for your producing royalties and Overrides, absolutely no delay, send complete details. 706 City Nat'l Bldg., Okla. City, Okla. REgent 6-7027.

GET TOGETHER: Both Capital and Royalties are available. If the investment proposition you want isn't listed in this column use a Journal classified advertisement to find it. See box heading for classified rates or write The Oil and Gas Journal.

PRODUCTION

We Will Buy

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Swiss Activity

Molasse basin shows spark interest in oil prospects

NEW interest is being focused on the rather marginal oil prospects of Switzerland.

Anglo-Iranian Oil Co., Ltd., has formed a Swiss affiliate, and several local European and Swiss companies are considering tests in the country's basin areas.

Anglo-Iranian's Swiss subsidiary was formed in Fribourg to acquire concessions, carry out surveys and drilling, and to develop and produce any oil found. Geological and geophysical exploration is under way at present in the Canton of Fribourg by Anglo-Iranian personnel, who formerly were in Iran.

Lucerne test . . . In Zurich, it was recently announced that drilling would be started soon near Altishofen (Lucerne) on behalf of a group of Basle financiers. A rig was supplied by International Tiefbohr, A.G., of Celle, Germany, and it is planned to take the hole to about 1,200 m. (3,940 ft.).

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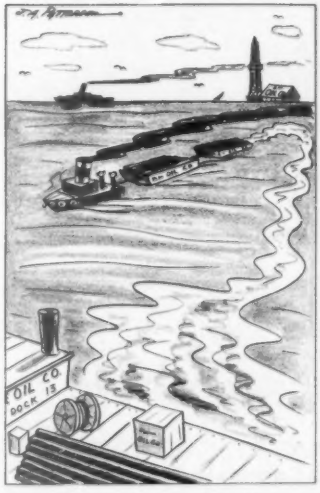

"Yes, that's what I said—I forgot my pipe—my tobacco, too, for that matter."

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LEGAL

U. S. DEPARTMENT OF THE INTERIOR, Bureau of Land Management, Washington 25, D. C. Notice is hereby given that the SE¼SE¼ sec. 4, T. 20 N., R. 3 W., Mich. M., Michigan, 40 acres, within the known geologic structure of the Headquarters field, will be offered for oil and gas leasing through competitive bidding to the qualified bidder of the highest cash amount per acre, at 1 p. m., Eastern Standard Time, September 10, 1952, when bids will be opened. Details of the lease offering and how and where to file bids may be obtained by addressing an inquiry to this office. Marion Clawson, Director.

LEGAL

337.67 ACRES of restricted Allotted Indian lands located within the jurisdiction of the Uintah and Ouray Indian Reservation, in Uintah County, State of Utah, in Township 12 South, Range 21 East, Salt Lake Base Meridian, are being advertised for oil and gas lease, bids on which will be opened August 28, 1952, at 2:00 P.M., at the office of Harry W. Gilmore, Superintendent, Uintah and Ouray Agency, Fort Duchesne, Utah. Full particulars may be obtained from the office of the Regional Oil and Gas Supervisor, U. S. Geological Survey, Casper, Wyoming, or from the Uintah and Ouray Agency.

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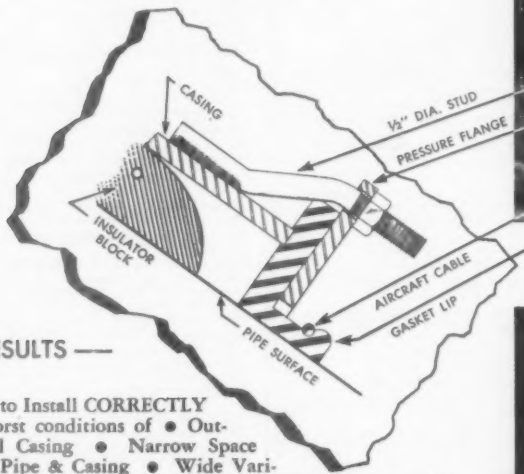

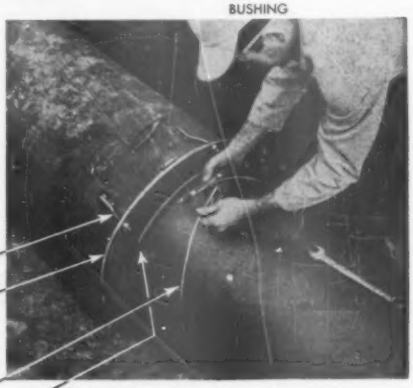

Assembling cable with rubber-covered union for clamping gasket lip to pipe.

RESULTS —

1. Easier to Install CORRECTLY under worst conditions of • Out-Of-Round Casing • Narrow Space Between Pipe & Casing • Wide Variations in Casing Wall and Coating Thickness • Mud • Casing ends beveled — by machine or hand torch.
2. WATER-TIGHT Seal with "L" gasket . . . . . .
   - BUTTED AGAINST CASING as pressure flange is tightened on ½" studs welded to casing.
   - TIGHT TO THE PIPE as aircraft cable (4,600# tensile) is tightened to gasket lip. Union is rubber covered to INSULATE galvanized cable assembly from bare casing structure.
3. Always Insulated from the pipe line when a Concentric-Support Insulator is installed just inside casing after the "drag section" is in place.

THE COMPLETED INSTALLATION
Note that galvanized cable and union are insulated from pressure flange and from pipe.

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*Patent Pending

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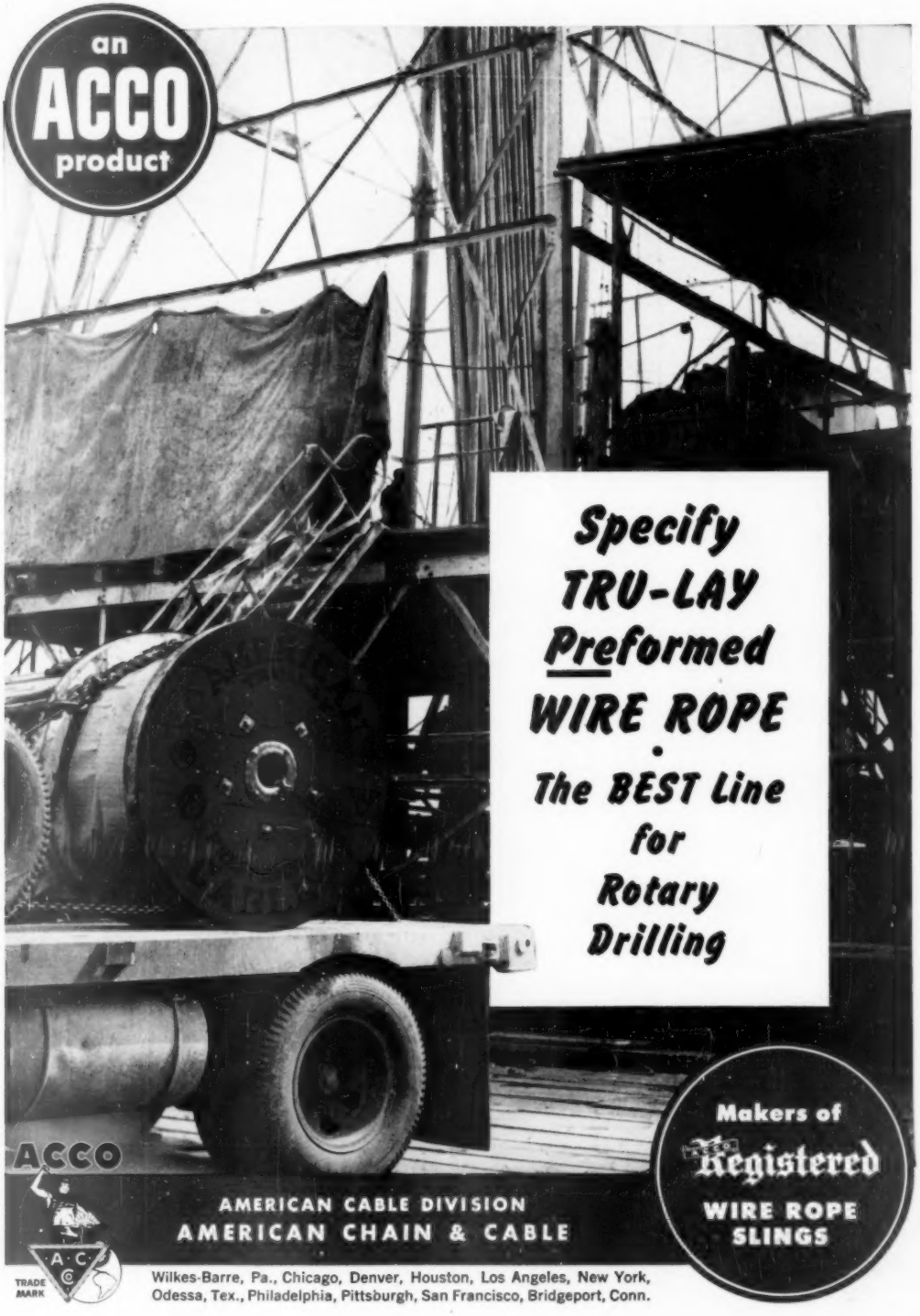
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— require *no selective fitting* to the drill pipe!

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— provide *4 points of seal* as shown in illustration at right!

Straight Grip TOOL JOINTS

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